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NEWSPAPER

Statistics Show Sex Bias Plagues DP

By Catherine Arnst
Of the CW Staff

Even though a majority of women in a recent survey [CW, July 23] reported encountering little discrimination in the DP field, a new statistical survey shows that in fact sex discrimination is pervasive and widespread.

Women in DP "are not receiving equal pay for equal work and may not be sharing equally in the opportunities for advancement," according to a recent study published in *Communications of the ACM*.

Women in the computer user industries comprised 99% of all keypunch operators employed in 1974, 20% of the computer operators and business programmers and 13% of the business systems analysts, the study found.

Overall, women constitute approximately 20% of the work force in the computer user industries (excluding keypunchers, the lowest-paid category).

The percentage of women in the computer equipment manufacturing industry is 31%, while 39% of the total national labor force is comprised of women, the report said.

Within each job category, broken down into three skill levels, a consistently greater percentage of males is found in the higher levels and males systematically earn a larger weekly wage no matter what the level, according to the study.

For example, 53% of all male keypunch operators (1% of the total) occupy the highest skill level position (Class A) and make an average of $178 per week, as opposed to $141 for the 42% of women operators in Class A.

Thirty percent of all male computer operators occupy that category's Class A and earn $197 per week, while 12% of the female computer operators are in this top position and earn $192.

Fifty percent of male computer operators are in

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Joins AT&T in Recommendations to FCC

IBM Supports Different Interconnection Plan

By Ronald A. Frank
Of the CW Staff

WASHINGTON, D.C. – IBM has joined with AT&T in urging the Federal Communications Commission (FCC) to reject a liberalized interconnection proposal.

Under the plan now being considered by the FCC staff, data communications and other equipment would be certified (registered) as technically safe for use on the telephone network.

If such a plan were adopted, it would eliminate, or at least change, the present requirement which calls for Data Access Arrangements (DAA) to be leased monthly from the local phone company.

IBM was among 28 companies, government agencies and industry associations responding to an FCC request for comments on the certification plan. The plan was drawn up by a joint board of FCC and state regulatory representatives and was based on an earlier report from the FCC's Office of Chief Engineer.

IBM Proposal

"The registration of interconnection devices by the FCC . . . involves an unnecessary degree of government regulation," IBM told the commission.

Instead, IBM proposed that the commission establish technical standards to protect the telephone network. Phone companies would then be required to incorporate these standards into their tariffs under the plan.

The IBM proposal is similar to an alternative interconnection proposal advanced by AT&T in its comments to the FCC.

The IBM plan would establish authorized "connecting-protective" modules (ACPM) to replace the presently required DAAs.

"The ACPM ought to be considered by the commission" and would include "technical standards equivalent to those which govern the level of protection" now included in DAAs, IBM said.

The joint board registration plan will not work because there are complex DP systems interconnected to the phone network, IBM said. These DP systems "utilize more sophisticated technologies such as digital logic, storage, read-only memories and stored programming and are often part of a larger system," IBM added.

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On Reselling Systems

HIS Clamps Down

By Nancy French
Of the CW Staff

WALTHAM, Mass. – Honeywell Information Systems (HIS) has dropped two policy time bombs that may make it nearly impossible for users to resell their Honeywell systems.

The first came as a warning in a letter to customers who own their systems, reminding them all software provided with those systems is nontransferable and, therefore, cannot be resold with the user's gear.

Users who have bought Honeywell systems from non-Honeywell sources since the policy was "formalized" have been quoted a basic license fee of up to $17,000 plus monthly charges of up to $1,000 for use of the firm's systems software and for software maintenance. (See related story on page 26.)

Secondly, Honeywell has told customers it will no longer guarantee equipment previously under Honeywell maintenance after it is resold.

Instead, the vendor is levying a minimum inspection charge of $380 against all systems sold to users by non-Honeywell sources, plus an additional charge for time and materials to install field change orders not made by Honeywell customer engineers at the previous site.

Until a machine is recertified as maintainable, Honeywell will not sign a maintenance contract, but instead charge its hourly rate plus materials fees for all work done by its field engineers.

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Catamore Suit Verdict Erroneous, IBM Charges

By Molly Upton
Of the CW Staff

PROVIDENCE, R.I. – The jury verdict instructing IBM to pay Catamore Enterprises, Inc. $11.4 million is erroneous and should be voided, IBM charged in a motion submitted to Judge Raymond J. Pettine.

Both sides in the IBM vs. Catamore suit filed motions following the verdict in which a jury awarded IBM its past-due $68,453 for goods and services and Catamore $11.4 million in damages for its countersuit [CW, July 9].

Catamore's motion asked for the judgment to be amended to include costs and interest, which could run between $3 million and $5.6 million, depending on the date on which the interest is computed, according to Thomas K. Christo, Catamore's attorney.

Catamore is entitled to interest on the judgment awarded it from the date of the commencement of the action at the rate of 8% per annum, the firm claimed.

The filings are seen as a preliminary step that could lead to round two in the case.

The IBM motion said the counterclaim verdict is "grossly excessive . . . inconsistent with the jury verdict for IBM in the full amount and, therefore, must be vacated."

'Serious Consequences'

In addition, "the counterclaim verdict rests on the failure to apply well-established principles

(Continued on Page 3)

Judge Orders DP-Aided Desegregation

By Edith Holmes
Of the CW Staff

CORPUS CHRISTI, Texas – A U.S. District Court judge here has ruled a computer will be used to help desegregate this city's elementary schools with a minimum of busing.

Taking the matter of school desegregation out of the hands of the school district, Judge Owen D. Cox appointed a committee of three computer scientists and three lay advisors to investigate plans that could be generated electronically.

One committee member, Dr. Joseph Rupp, the county medical examiner and an officer of an antibusing group called Concerned Neighbors, Inc., first suggested the court consider a computer-created plan.

Rupp noted that, while the school district has been working on million-dollar plans to desegregate its elementary schools for the last four years, the court-appointed committee has devised plans that should cost no more than $100,000 in five weeks – and with a minimum of busing.

"Children may have to walk a little further, but the neighborhood school concept won't be destroyed as it would be with forced busing," Rupp said.

All of the plans submitted to the judge will have this characteristic, and the court will decide on a particular solution in time for its implementation by the opening of schools at the end of August, he added.

Rupp made his suggestion to the court at the final hearing on the six or eight plans

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DP Fraud Charged

Court Orders Recount in El Paso Election

By Nancy French
Of the CW Staff

EL PASO, Texas – U.S. District Court Judge Sam Paxson has ordered a recount of some 60,000 ballots cast in this city's April mayoral election in which fraud was charged by the defeated candidate [CW, June 25].

The charges were filed by Woodrow W. Bean, who was defeated in his bid for the mayor's job by 3,000 votes in an election conducted with polling equipment and software from Computer Election Systems (CES) of Berkeley, Calif.

The charges were based on findings from tests conducted by Management Analysis, Inc., a systems house here, and subsequent information provided by a Los Angeles firm specializing in computer fraud investigation.

Paxson called for the results of the recount to be sealed until Sept. 2, when they would be announced in open court. In the meantime, the new mayor has already taken office.

John D. Daniels, a computer programmer who helped test the El Paso election system for Management Analysis, said the judge missed the point in ordering the recount.

"I don't give a flip who won the election," he said. "It's the system we're challenging and it's so full of holes you can drive a truck through it."

Daniels, who specializes in writing edit programs, said one of the system's "major failures" was its acceptance of any number of voter cards in a row that were exactly alike.

"It would even accept a thousand blank cards in a row," Daniels explained. "This is unreasonable and should have been flagged as a possible error."

Someone could change the outcome of the election by simply substituting 1,000 blank cards for 1,000 real votes, he said.

County Election Department officials familiar with the allegations are reserving judgment until the results of the recount are announced, according to Louis Youkey, Elections Department administrator.

"If irregularities are discovered, we will conduct a further investigation into the matter," Youkey said. At present, however, "we have complete confidence in the system."

According to Daniels, the story began about two weeks before the election when the local Democratic Committee requested Management Analysis to test the vote-counting system in the nonpartisan mayoral race.

In preparation for the test, Daniels made up a deck of 2,000 cards to check for every type of error he could imagine.

After the test was run on election night, Daniels concluded that fraud could have been engineered "with ease because the CES system just counted votes – it had virtually no edit program. That's the simplest way to put it," he said.

Daniels said he learned from the test that "someone interested in fraud could have spoiled votes and CES would have ignored them. He could have made up votes and CES would have counted them. He could have even added a fictitious precinct and CES would have accepted it.

"I'm not saying fraud was committed. What I am saying is that a much better computer vote tabulation system should be written to make sure fraud does not occur in the future," Daniels said.

IBM Urges FCC to Reject Plan

(Continued from Page 1)

Interconnection is only an "incidental function" to the more complex DP operations, the company said.

Small microprocessors now perform the signal modulation normally done in modems instead of discrete components, IBM told the FCC, and these microprocessors also contain logic which performs "data link control, bit stuffing, serializing and deserializing" of data.

These other functions are necessary for operation of the DP system, but do not affect interconnection of the device to the phone network. And, as this type of architecture comes into increasing use, the modem as an "identifiable device" will disappear, IBM said.

With this integrated equipment, the requirement calling for a "test model" to be sent to the FCC for registration approval could require that "the entire DP system be made available for inspection," IBM argued.

Much of this information is "highly confidential and proprietary" and would not be submitted unless assured of confidentiality, the firm said.

The "protective capability of existing connecting arrangements" is fully adequate and should provide the basis for an ACPM alternative, administered by the phone company, IBM said.

User Benefits

Among those supporting the joint board plan because of its user benefits was Virginia Knauer of the Office of Consumer Affirs (OCA). The office "strongly supports the adoption of rules such as those proposed.

"The design and construction of a terminal device, not the identify of its owner or manufacturer, determines whether it can be connected to the telepone network without causing harm," OCA said.

Under the joint board plan, "purchasers or lessees of interconnection equipment would not have to pay additional installation or monthly charges for telephone company-supplied connecting arrangements," OCA said.

And phone companies would "no longer be able to lease a piece of terminal equipment for direct connection to telephone lines while denying the same right of connection to customers purchasing or leasing identical equipment from a different source."

The Justice Department told the FCC an equipment registration plan provides an effective way of protecting consumer interests.

"We are aware of no credible evidence that a soundly based equipment certification program would significantly increase technical harms to the telephone network beyond the harms caused by malfunctioning or defective carrier-supplied equipment," the Justice Department said.

Also favoring the joint board plan was the Independent Data Communications Manufacturers Association (IDCMA) which said it would result in savings to both vendors and customers "when compared to the costs of the DAA.

"The user will realize significant cost savings that will no longer be required for each modem at charges that range as high as $8.30/mo in some areas," IDCMA said.

AT&T said the joint board proposal would lead to higher costs for all telephone users. The plan would result in a deterioration of all customer services while its ACPM alternative would allow customers to have their own data equipment through built-in protective devices.

The Interconnection Office of the FCC staff will evaluate the responses and then submit its recommendations to the commission. No target data for the staff report had been set last week.

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Statistical Survey Uncovers Sex Discrimination in DP

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Class B. earning an average of $167 per week, while 55% of the female operators occupy this skill level and earn $157.

Class C contains 20% of the male operators, who earn $139 per week, and 33% of the women operators at a salary of $137.

Of business programmers, 38% of the men employed in this job category are in Class A compared to 28% of the women; these men earn $265 weekly while the women earn $257.

Class A of business systems analysts has been attained by 44% of the males in this job category and 26% of the females, with men earning a weekly average of $324 and women $313.

Discrimination in employment thus manifests itself both in unequal pay for equal work and unequal access to higher-paid positions, the study's authors, Richard E. Weber and Bruce Gilchrist, wrote.

In looking at corresponding data for 1969 through 1972, they also claimed that "except for programmers, where salaries and skill categories have improved somewhat for females, the percentages are similar.

"It has been more than 10 years since the passage of the Equal Pay Act and Title VII of the 1964 Civil Rights Act, which were intended to end employment and wage discrimination," they pointed out.

The authors used three sources for their data: the decennial U.S. Census, the U.S. Department of Labor's Standard Industrial Classification employment data, published, monthly, and the Bureau of Labor Statistics' annual Area Wage Surveys.

While managerial and higher level positions are not covered by the Area Wage Surveys, the authors said "the relatively small percentage of women in the higher skill categories of business programmers and business systems analysts indicate that we should not expect to find many women in senior positions in DP."

They cited two personnel surveys conducted by the American Federation of Information Processing Societies (Afips) in support.

In a 1967 survey of all members of Afips' constituent societies together with members of the Data Processing Management Association (DPMA) and the Numerical Control Society, 8.4% of the 30,000 respondents were female.

In a similar survey in January 1971 which included nonmember attendees of a Joint Computer Conference, 8.9% of 8,500 respondents were female.

IBM Calls Verdict Erroneous

(Continued from Page 1)

of law governing the rights, duties and expectations of the parties here.

"If upheld, it will have most serious consequences for others as well, ignoring rules of law having their basis in the universally recognized need for some substantial certainty and stability in commercial transactions between experienced business organizations."

IBM's lengthy motion was signed by attorneys for Edwards and Angell, the Providence firm it used in the trial, as well as general IBM counsel Nicholas deB. Katzenbach and six lawyers from the firm of Cravath, Swaine & Moore, which is representing IBM in the U.S. vs. IBM antitrust trial.

"There is no legal theory, alone or in combination with others, which can convert the bargain struck between the parties . . . into some sort of an insurance policy under which IBM is liable, come what may, for virtually limitless sums while, at the same time, it has been judicially determined IBM must be paid all the money Catamore agreed to pay," the IBM motion said.

Sets Precedent

It warned of the precedent such a judgment sets. "Applying the teaching of the result here to future transactions, it is literally true that any amount, no matter how vast, may be recovered by a plaintiff in Catamore's alleged shoes.

"The only limitation would appear to be the extent of the imagination of whoever may have casually projected 'profits,' " the chief said.

"Thus, any man's pipe dream becomes the only limitation on contractual liability. The inhibiting effect that such a rule would have upon normal commercial transactions is most disturbing," it added.

Calling the jury award of $11.4 million in damages "inherently incredible," the IBM motion enumerated reasons why the verdict should be vacated.

IBM noted the "counterclaim award was irremediably infected with error, speculation, duplication and hopeless inconsistencies."

'No Fault' Insurance

For example, "Damages claimed on the basis of profit projections for a new enterprise or a different business venture often, as a matter of law, are too speculative to form a permissible basis for an award," the IBM brief claimed.

"In essence, the Catamore claims and the jury verdict require IBM to pay not only damages that normally and directly flowed from a breach of its contract, but rather to supply 'no fault' insurance that Catamore's wildest fantasies will come to fruition. . . . In addition, the claims and the award have made IBM an unknowing guarantor of Catamore's profitability – and at an unprecedented level."

Further, IBM's written statements explicitly limited the firm's liability, the brief said.

IBM also contended the jury's award to IBM for its claim for goods and services established that IBM had no liability to Catamore.

The inconsistency requires a new trial, the motion said.

The counterclaim verdict "ignores the written agreement between the parties, which limited IBM's liability, and depends upon claims said in the charge to the jury to arise from oral promises, under which no money was to be paid to IBM and IBM's liability was unlimited.

"This would be a very, very strange business transaction for an experienced commercial corporation like IBM to undertake or for an experienced commercial corporation like Catamore to rely upon," the IBM motion observed.

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In Two Policy Time Bombs

Honeywell Clamps Down on Users Reselling Systems

(Continued from Page 1)

Honeywell charges no such licensing or maintenance fees to users who purchase their used systems directly from Honeywell.

When the vendor sells a system, "the user is licensed to use the operating system, which is furnished at no extra cost, but there is some consideration in the equipment price to cover the cost of such software," a Honeywell spokeswoman explained.

However, software which is sold to users and for which Honeywell is initially paid remains the property of Honeywell. It must be paid for again by the new user – "That's the policy," she said.

Used equipment traders have made it a practice to include whatever software a system has on it each time that system is resold. This general rule applies not only to Honeywell equipment, but also IBM and Univac.

Spokesmen from those firms confirmed the do not charge a second user for software.

Honeywell added the nontransferrability clause to its purchase agreement in 1970 after selling its 200 through 2000 series equipment for six years with no such restrictions.

Ironically, many of the systems now being traded through used equipment dealers and between users are systems purchased from Honeywell before 1970. Nevertheless, Honeywell expects to include even these older systems under the more restrictive licensing policy.

The Honeywell actions have made it so expensive for users to buy equipment from each other or from a non-Honeywell vendor that it will be virtually impossible to resell used equipment, according to some users who have tried to buy used systems.

"Honeywell is trying to kill off the second user market for their equipment," William P. Hegan, chairman of the board of TBI Computer Sales, said.

His firm has given up on Honeywell for maintenance and installation of systems in favor of Raytheon Corp., which provides such services on a third-party basis, Hegan said.

As an example of some of the problems that have cropped up with the new Honeywell maintenance policy, one user from the Midwest said, "We signed a contract with Honeywell to install a new CPU purchased from a used equipment dealer, and were denied parts by Honeywell because we were not 'a leased account' and had 'no maintenance contract.'"

His maintenance contract was terminated the day the old CPU was unplugged, he said, and Honeywell declared the contract void until the new CPU was "certified."

Certification took eight weeks. In the meantime, Honeywell field engineers had to cannibalize the old machine for parts and fly in extra long cables from a secondary source halfway across the country rather than obtain them from Honeywell's maintenance facility 100 miles away.

For all other services, the user paid an hourly rate during the eight-week hiatus.

In contrast to Honeywell, IBM loosened its rules recently by dropping the requirement for maintenance certification letters for systems that change hands, an IBM spokesman said.

Under the old precedure, the manager of the IBM branch office responsible for maintaining a system was required to send a letter to the manager of the branch office that was being asked to take on maintenance to confirm service had been performed regularly and the system was acceptable for IBM maintenance.

Since IBM now has a management information system that provides a complete maintenance history on all systems serviced by it, accessible in each branch office via CRT, that paperwork is no longer required, he said.

A system previously maintained by IBM is accepted for continued IBM maintenance automatically, without inspection, the spokesman said.

Systems not under previous IBM maintenance are accepted for IBM maintenance after a free inspection. At that time the customer engineer informs the user what repairs are needed to bring the system up to acceptable standards; after these repairs are made, the customer is given a maintenance contract.

IBM charges for any damage that occurs during shipping or deterioration resulting from storage and for releases announced during the period the system was off maintenance. But in no case will IBM refuse to precertify a system that has been under its maintenance, the spokesman said.

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DP Ordered for Desegregation

(Continued from Page 1)

submitted by the school district late this winter. Persuaded by trial runs on local machines that a computer could best handle the problem, Cox made his ruling in favor of its use.

Whichever program is finally selected by the court, it will be governed by two factors, according to Rupp.

One is that in Texas, if a child lives within two miles of school, transportation need not be provided; and the other is that, in any urban setting, the chances are there will be more than two schools within two miles.

The plan must also achieve an ethnic mix of at least 75%-25% at each school – no school will be more than 75% white or more than 75% Mexican-American and black combined.

A member of the court-appointed committee and computer systems advisor for the Mobil Oil Co. branch here, Richard G. McCracken, said the programs have been run in donated time on an IBM 360/65, 370/158 and 370/145. The machines belong to local companies.

The committee adapted the canned IBM Mathematical Problem Solution (MPS) package to the city's problem of integration, McCracken said. The programs involved 605 equations with 17,000 unknowns in each equation.

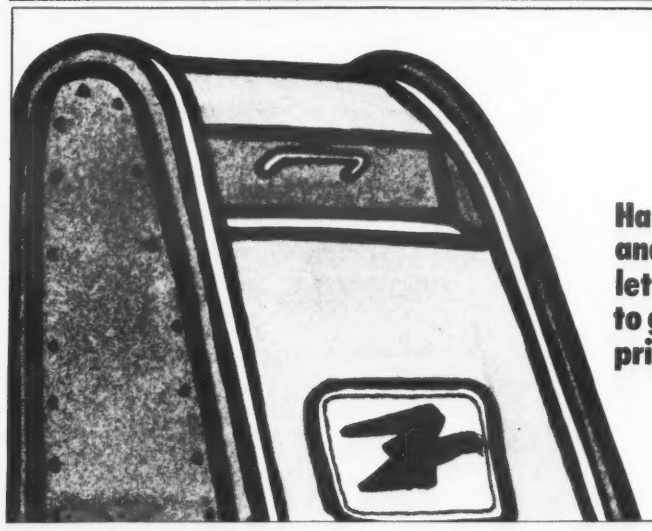
"It took us 4,000 iterations to come to an optimum solution," he noted.

McCracken also wrote a Fortran front end for the package to save handling the 200,000 cards that would have been required. This gave the mainframe a tape card image with which to work.

In addition, he wrote still another program in Fortran to translate the results of the package into English.

"We used the IBM package to minimize the variables we needed to look at and to optimize each child's assignments within the restraints given," McCracken said.

"We're not saying we'll come up with the best plan in the time limits set by the court," Rupp added, "but what we do devise will work. It isn't going to please everyone but, when it is finalized, we think the plan will be acceptable."



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Governor Signs Amendments to Minn. Privacy Act

By Nancy French
Of the CW Staff

ST. PAUL, Minn. – Gov. Wendell R. Anderson has signed amendments to the Minnesota Privacy Act that establish a privacy study commission, reclassify personal records from private to three categories –public, private and confidential – and rescind the provision requiring local governments to report the existence of personal records classified as public information.

The recent changes came at the recommendation of the state's Department of Administration, responsible for implementing the law, after a year of struggling with the realities of recordkeeping within the state's local, county and state agencies.

Under the amended law, the six-member privacy study commission will examine executive orders and existing regulations to determine if they are consistent with rights granted to the public under the law.

It will also determine to what extent collection, storage, use and dissemination of data on individuals is affected by the requirements of the federal Privacy Act of 1974.

The commission is empowered to recommend to the legislature suggestions for future legislation, administrative action or voluntary adoption of additional procedures it deems necessary to protect the privacy of individuals while meeting the legitimate needs of government and society for information.

Deciding last year's legislative definitions of privacy were "too abstract" and were only making the job of classification more difficult, the lawmakers also assigned to the privacy board the power to specify what categories of information should be considered private.

Three Categories

In accordance with the reclassification of personal information records, data will fall into three categories.

Public information is that personal information which is open to the public at large, such as salaries of state government officials.

Private data is defined as information which is not accessible to the public, but is accessible to the individual about whom the information pertains.

Confidential data is that information which is neither public nor private and is not accessible to the person about whom it has been collected.

The amended law dropped the previous requirements that towns report annually on their files of personal records.

Section 3 of the law was amended to close a loophole that permitted a "responsible authority" to file a statement of intent in order to use data on individuals without actually obtaining the consent of the individuals involved.

By definition, public information is accessible and therefore those who provide it need not be warned of the information's additional possible uses.

Finally, the law made no exemption for law enforcement records.

System Helps Deter Auto Theft in Calif.

By Catherine Arnst
Of the CW Staff

SACRAMENTO, Calif. – If you own an Impala, Volkswagen or Mustang and live in California, the chances of having your car stolen are greater than if you owned any other make or model.

This comforting information comes from the Vehicle Theft Information System (VTIS), a computerized system operated by the California Highway Patrol which catalogs all auto thefts throughout the state.

The system receives its data on tape from 16 regional police agencies. The tapes are compiled at the state's computer center, using an Isam-based system.

All thefts are broken down by places on occurrence and recovery, make, model and year, and a monthly report is issued. These reports are then sent back to the regional agencies on a monthly, quarterly or semiannual basis.

VTIS has been in the development stages for 2-1/2 years; the first monthly report was produced in February.

Currently the only one of its kind in the country, the idea for the system came about from legislation passed in 1970 directing the California Highway Patrol to perform a study of theft and to introduce methods for halting the rising crime rate.

Sgt. Peter O'Rourke, the system coordinator, said police hope to detect a pattern of movement with VTIS. Thus, if a large number of cars are being stolen in Los Angeles and recovered in San Francisco, police in both areas can work together in apprehending the thieves.

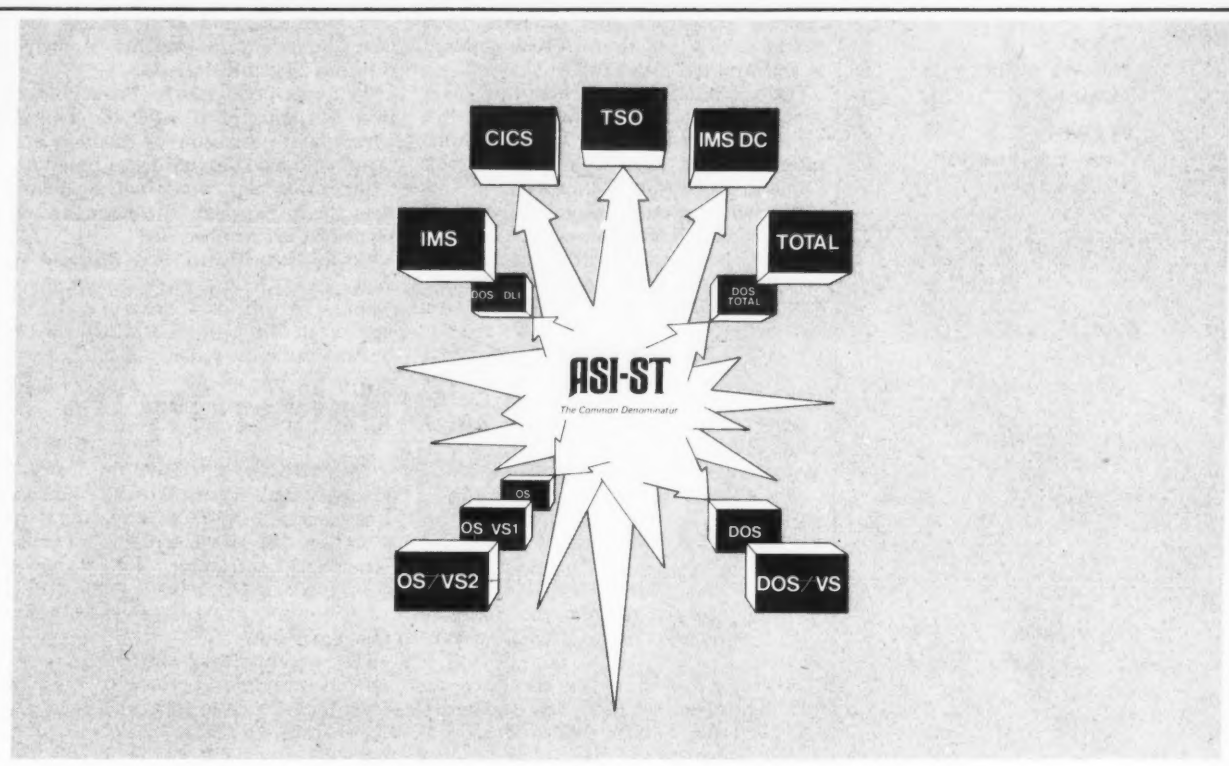
The monthly report also gives clues as to how many cars are the targets of professionals. O'Rourke said they've discovered that 75% of stolen vehicles are recovered intact, indicating they were probably taken only for a joyride by teenagers. Probably only about 18% of all car thefts in California are the target of professional thieves, O'Rourke said.

Reaction from the regional agencies using VTIS is favorable, and the only problems involve meeting deadlines due to input delays, O'Rourke said.

VTIS has had little effect on a statewide basis as yet, he said, but local agencies have found it helpful in watching for the types of cars most frequently stolen in their areas.

O'Rourke said VTIS could eventually become a nationwide system, although reporting methods used by the states, often widely varied, would have to be standardized.

Such a system appears to be a long way off, he added, since he could find only 18 states that can even compile printouts of the total number of car thefts.



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Honeywell Helps Compile Data for Boston Marathon

BOSTON – Runners from all over the world departed en masse one day last April from Hopkinton, Mass., for the finish line here in the first computer-assisted Boston Marathon.

Before the race, Honeywell had donated its services and systems to the Boston Athletic Association (BAA) to help process the 2,365 Marathon entries and correlate data on Marathon results

Runner Administration and Computerized Entry Routine (Racer) programs written in PL/I facilitated the input of information alphabetically (by name) and numerically (by BAA-assigned number), into the data base, according to Ben Parenteau, manager of computer resource planning and analysis at Honeywell and director of the Honeywell systems team on the Marathon project.

Along with this information were input listings of medical information and certification – crucial for a 26-mile race.

The system then printed a mailing list which was used to send runners verification of money and medical certification received by the BAA and the numbers assigned for the Marathon.

When the runners appeared at the Hopkinton High School on the day of the Marathon, the BAA and Honeywell teams were ready for them.

Information which had been compiled manually in the past was categorized and assigned by the computer.

"There were 50 recognized runners alone to enter into the data base on race day. We made three lists of subroutines for the unofficial and post entries and for team information, including team names and runners' names, and entered the information into the data base," Parenteau explained.

After the beginning of the Marathon, the Honeywell team and BAA officials moved to the finish line area to prepare for the deluge of information to be compiled.

There, the Honeywell team input all prerace information into the four Terminet 300 terminals which would access the data base via telephone lines on the Honeywell Multics time-sharing system which was built around a 6180 CPU.

Then, as 1,846 runners crossed the line before the cutoff time, members of the team waiting at the finish line brought separate lists of Marathoner's numbers and times to center where the data was correlated.

Unofficial List

Three terminals were used to send information to the computer 18 miles away. A fourth was used to access the data base and receive answers to "any number of questions" concerning runners' names, state or country, sex and single position or team position for an unofficial list to be used by the BAA for verification, Parenteau said.

The unofficial list was ready by 5 p.m. on race day, according to Will Cloney, president of the BAA, but it took weeks to verify all the data, he said.

It was hard to accurately record all runners' times and numbers between about 3:10 and 3:30 p.m. because up to 40 people were crossing the finish line simultaneously, Cloney explained.

"I'm delighted with the assistance offered by Honeywell and pleased that the man who programmed the computer was himself an ex-Marathoner," Cloney said.

"We will definitely use the system again next year if it's offered. It was a great, great help," he added.

Hiroshima Bomb Victims Fight Plan to Centralize Health Data

HIROSHIMA, Japan – Victims of U.S. atomic bombs dropped here in 1945 are fighting the city's plan to place their health records and those of their children in a centralized data bank.

There is no privacy law here to protect such files from access by individuals with no legitimate need to know such personal information or even to permit an individual to access to his own file.

The fallout victims, therefore, are fearful such records will follow their children, labeling them and resulting in discriminatory treatment, according to Yae Hatano, deputy secretary general of the Central Congress for Privacy Protection.

The Hiroshima data bank program, announced four years ago, received widespread publicity, and, since then, files on all Hiroshima residents have been started, some including information such as religious beliefs and political affiliation.

The file of atomic bomb victims is expected to be added to the central data base in 1977.

Many data banks have been established in this country with no citizen-based privacy objections because the Japanese were confident the data would not be abused.

However, such trust was misplaced, according to Hatano. In the city of Yonezewa, a private company under contract to the city government, established a central data bank of citizens' tax records, pensions, voter registration information, education and welfare records and then sold the information.

Lists of children entering school each year were sold and even "tailors could have found out the heights of people" from the file, said Hatano.

The Central Congress for Privacy Protection was set up to fight the Japanese government's decision to establish a national data bank, according to Hatano.

Under that plan, every individual would have been assigned a unique personal identification number.

Although the plan was dropped last year, the Congress suspects the government will introduce an alternate plan next year, using as an excuse a national health insurance system.

University to Build DP Museum

PHILADELPHIA – The University of Pennsylvania's Moore School of Electrical Engineering will build a computer museum on the site where the Electronic Numerical Integrator and Computer (Eniac) was built.

Eniac was the first large-scale electronic digital computer.

The museum has been approved as an official Bicentennial project by the state's Bicentennial Commission and is expected to be ready for visitors in early 1976, just 30 years after Eniac was dedicated.

The museum is intended to provide a lasting historical display centered on the machines developed at Penn and the men who made them, as well as a living record of continuing achievements in computer technology, a university spokesman said.

The museum will have three divisions: an exhibition on the development of Eniac and its successors, archives containing records on machines developed at Penn and elsewhere and a reference library of the most important books and articles on the development of computers.

Eniac components, on long-term loan from the Smithsonian Institution, will hold a key spot in the exhibit area, according to planners.

Other machines slated for display include a mechanical differential analyzer, developed in 1935, as well as parts or replicas of the Electronic Discrete Variable Computer (Edvac), a smaller but more versatile machine developed in 1949; and Universal Digital Operational Flight Trainer (Udoft), a 1958 forerunner of equipment that plays a vital role in aircraft safety today. All were built here.

Visitors will be invited to use "hands on" terminals tied to the school's CPU to play simple games and experiment with diagrams of such things as the structure of atoms.

The museum was conceived in 1973 by E. Stuart Eichert Jr., an alumnus, and Moore School Director Harvey L. Garner.

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Editorials

A Serious Loss

The demise of Xerox Corp.'s Data Systems Division [CW, July 30] was a serious loss for users and vendors alike. The first reaction to such a loss focuses on the jobs, user problems, finances of the company, etc.

But there is a larger, more intangible opportunity that has slipped away, at least for the foreseeable future. It is a technological opportunity that some in the industry felt had great promise.

When Xerox first acquired its computer capability, it seemed almost certain there would be a technological marriage between computer and facsimile technologies. The technical people who advanced this idea reasoned Xerox was already a front-runner in the transmission of facsimile data.

And if this technology was combined with the digitizing capabilities of a mainframe, entire new application areas would undoubtedly evolve. These same experts understood Xerox was one of the few firms with both the technical and financial resources necessary to implement this exciting concept.

But the scenario was never played out. Apparently, Xerox decided the time was not yet here to carry out a technological marriage that could easily have created a new subindustry of data processing.

The real reasons for this missed technological advance may never be known. To be sure, there are some smaller companies that continue to explore the basic concepts. But Xerox had the resources to merge these still-divergent technologies.

The fact that such a merger never was achieved is a technological tragedy we will all have to share for some time.

Where Is the Government?

There is a notable absence among the organizations that have filed amicus curiae briefs with the Supreme Court in the appeal of the IBM vs. Telex decision [CW, July 9] — the U.S. Government.

Incredibly, the government seemingly has no interest in acting as a "friend of the court" in the Telex case, even though it is now trying IBM on many of the same issues in its own antitrust suit.

Clearly the government is having problems handling the massive amount of material in its suit against IBM.

At the same time, a definitive Supreme Court ruling on the issues presented by the Telex case could conceivably cut down the work required of the government.

A ruling could do this by cutting the number of issues that have to be presented in court. In fact, if the Telex case were decided in a coherent manner, both sides could cite the record of that trial and the appeals and, therefore, not have to produce any evidence on the peripherals issues covered by Telex.

This could save a good deal of taxpayers' money as well as a portion of the IBM legal defense budget, which is ultimately being paid by IBM stockholders.

Therefore, the refusal of the government to file an amicus brief with the Supreme Court is puzzling.

But, with the government's record for prosecuting the present case against IBM, probably its failure to act in this area should not be surprising.

A more positive approach by the government could not only affect the earlier Telex case, but also have a significant impact on the government's own suit against IBM.

'See? That Sign Proves We Must Have Started.'

Letters to the Editor

'Majority' in Sample of 30 Doesn't Portray Real Situation

By coincidence, my July 23 copy of *Computerworld* arrived at the same moment as my July copy of *Communications of the ACM*. On CW's front page was a feature proclaiming a "majority" (based on a sample of 30 women) of women DPers are satisfied they have not encountered discrimination.

By contrast, *Commmunications* featured an article from which I quote:

"Although suitable data are not abundant, enough exist from which to draw some general conclusions on employment by both computer manufacturers and computer users. Unfortunately, as will be shown in the following sections, the available data suggest that women are not receiving equal pay for equal work and may not be sharing equally in the opportunities for advancement.

"These rather harsh conclusions could be somewhat tempered by the fact that the computer field probably looks good in comparison with many other fields and may indeed be ahead of most. Such a temperance, however, may lead to complacency. Hence we prefer to direct our attention solely to the computer industry and to challenge our colleagues in the industry to face up to the facts and to improve the positions of women in the industry."

I am curious as to how representative CW's sample of 30 is of the larger population of women in DP.

I think the real situation is closer to that indicated by the fact the Data Processing Management Association still recognizes outstanding achievement in the field of computer science, which has been integrated for years, by selecting a Man-of-the-Year.

I doubt Captain Grace Hopper, for instance, felt honored at the title, although she was the first to be so named.

Judith B. Edwards

Iowa City, Iowa

Test Proves Sex Bias Rampant

I feel CW's article on job discrimination against women DPers was misleading. It is hard to prove women (or a specific woman) are discriminated against when managers are selected, because the process is subjective.

Competence is only one factor. Another primary factor is how well a person will fit in with the management team. Men perceive ipso facto that only a man will fit in.

The ultimate test of discrimination/nondiscrimination is: "How many women are in DP management?" The answer is: "Almost none."

By that test, discrimination is rampant.

Jean J. Bartik

Pennsauken, N.J.

Caravan Attendees Not Average

I am very disappointed in *Computerworld* for publishing the article about discrimination against women in DP. Thirty women Computer Caravan attendees are not a representative sample on which to base the conclusion that the "majority of women DPers have never met any sexual discrimination."

The average woman in DP does not have the luxury of taking time off from work for professional development. A much better sample would be a poll of the female subscribers to CW. A larger sample with more varied backgrounds could then be used.

I've been in the computer programming field for 11 years. I have been discriminated against in many of my jobs. In the early years, New Jersey laws prevented females from working overtime. I still had to work the extra hours, but was not allowed to report them and, therefore, didn't get paid.

In my current job, there are men with half my experience who are three job steps ahead of me. The majority of the men at my level have had only four to five years of DP experience.

I am good at my job and have had excellent performance reviews. There is no good reason for my not getting promoted.

Name Withheld by Request

Many Women Disgrace Themselves

Judith Lightfoot contended sexual discrimination in the "overall picture of the industry is a disgrace" ["Lightfoot Calls Token DP Hiring Hindrance to Women," CW, July 23].

What is more of a disgrace is women who are strictly concerned with the aesthetics of a "position."

The very nature of DP often requires working long and odd hours. As a DP project manager for a large chemical company, I have interviewed and worked with many women who are not willing to put forth the effort required for a job in DP.

Until women are willing to work industriously and conscientiously and not expect to be promoted or hired because they "smile real nice," they will not be able to advance in the field of DP or in any other.

Sandra Keller

Long Island City, N.Y.

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Letters to the Editor

Slinging Mud at NCR Not New for Grosch

In reference to Herb Grosch's latest tirade against NCR Corp. or "National Cash" as he so meanly called this company [CW, June 25], one expects more responsible comment from the editorial director of this very influential computer publication.

Grosch has always tried to sling mud at NCR and its products. Last time around was March 1974, when he worried about NCR's software and the upward compatibility of the Century series.

Fortunately his remarks drew such overwhelming praise for NCR from users that he had to, begrudgingly, shut up for over one year.

Now he is at it again. He belittles a high-technology organization and its 90,000 employees and insults the intelligence of thousands of users by writing the company off the face of the earth with a stroke of the pen to justify his earlier silly prophecies.

And all this at a time when NCR is investing millions of dollars and years of manpower on developing new products.

As a fellow Association for Computing Machinery (ACM) member, I would advise the dear doctor to pay more attention to our industry's professional ethics and replace biased reporting with objective journalism.

R. Taha
Tehran, Iran

Feedback Good for DP

In response to Lane E. Taylor's recent letter about overpublicizing of "computer foul-ups" [CW, July 2], if computer-related errors were common rather than infrequent, they wouldn't be newsworthy.

Thankless labor and public criticism is an inevitable "reward" of a good reputation, as any harassed policeman or smoke-stained fireman knows.

If computer foul-ups reach the newspapers, it means they're not being corrected at the source. Feedback cannot be prevented – only diverted or delayed. Would Taylor prefer that his customers suffer in silence until their frustrations boil over into disastrous legislation or sabotage?

Let us not make the mistake of entangling our identities with our work to the point where criticism is received as an insult.

When I read of a "computer foul-up," it may irritate or sadden or challenge me – but it rarely insults or enrages me.

Heaven may reward you for your dedication and excellence, Taylor, but, in the meantime, welcome to the ranks of the "unjustly tarnished."

Robert Higgins
Brooklyn Heights, N.Y.

Announcement Incentives

Recent financial analyses of the IBM 360/370 picture, and reports from used-equipment brokers, are very significant artifacts in assessing IBM intentions next year. Clearly, enthusiasm on the part of 360 users and recent 360 purchasers and lessees indicates bang-for-a-buck problems for The Mother of Us All.

Of course, that sort of thing cuts both ways. Major price reductions to increase the attractiveness of the 370s coming down the lines around the world could indicate a determination to push the current product, which in turn would make neo-FS announcement next year unnecessary.

I think you have to look inside the special universe of IBM for interpretation. Forget about the customers, direct or via third party. Forget (sigh!) about Amdahl and Cray. Forget about futurists and philosophers, like me! Instead, visualize a world empire whose every shah and satrap is a lifelong salesman. And in your vision, compare the deep-down, visceral satisfaction of a huge 1964-style blockbuster versus a Mickey Mouse price adjustment.

Moreover, there are technological forces. If you spend literally *billions* of dollars per computer generation on R&D, the internal pressures to use the more marketable results become enormous. Note I said "internal."

Finally, dominance via novel product announcement – not of paper machines but of real innovation – has not been ruled out by U.S. courts. The Common Market bureaucrats are deeply disturbed by that kind of power, but when much of the new stuff comes from European IBM laboratories, objections are difficult. Want to have 'em shut down? Of course not!

So I continue to believe that there is a Big Bang in our future, that regardless of the user community and the competition and the courts, IBM executives and salesman and scientists and manufacturing engineers will burst out with a new family, with new hardware and software. Some of it will work, all of it will sell.

Or rent, of course. As the sonnet has it,

Not mine own fears, nor the prophetic soul
Of the wide world dreaming on things to come,
Can yet the lease of my true love control.
Poor customers!

Herb Grosch

Consumer Sensitivity Missing in Many System Designs

The Taylor Report
By
Alan Taylor, CDP

A fascinating question was raised by Spencer Nilson, Californian publisher of a credit-card industry newsletter called the *Nilson Report,* after reading the recent Taylor Report on Michigan BankAmericard's refusal to change a cardholder's billing date on request [CW, July 9].

Nilson asked whether the real reason behind the refusal was that there was something inflexible about BankAmericard's computerized system, rather than that a conscious "don't-care" attitude of Michigan BankAmericard's directors exists toward its customers.

The basic idea that the behavior of corporations can be controlled to some extent by the inflexibility of its system design has been broached before.

Generally, however, it has been handled in the technical realm of costs of conversion, etc. Nilson suggested this idea had spread from the technical realm into corporate management matters.

He saw that the appearance of such corporate-level arrogance, no matter how caused or how covered up, would naturally result in increasing the membership of the various consumer groups.

Nilson's ideas on where the importance of system design inflexibility really lies were independently supported by another reader who spoke from considerable experience. This reader has been deliberately taking consumers into account in designing credit-card processing systems and has lived with the results for some years without regretting it.

The reader, Bertram Tobin, vice-president of New York's Chase Manhattan Bank National Association, said system designers should regard themselves as in-house consumer advocates.

He believes this method of system design can avoid creating the appearance of "corporate arrogance" in the public mind, which is fostered by the traditional system design methods.

Both Nilson and Tobin based their conclusions about the importance of consumer consideration on two assumptions:

- Michigan BankAmericard's refusal to change its cardholder's billing date did not accurately reflect corporate wishes.
- Michigan BankAmericard's system for changing billing dates must be so cumbersome it is easier for the staff to reject such requests than to honor them.

My conversations with the various people involved at BankAmericard seemed to support the first assumption. Everyone I talked to showed a willingness to let the cardholder change – if only he'd go through the proper procedure.

There was some unwillingness to bother informing him as to what the proper procedure is, I noticed – but that is a different matter altogether.

Four-Step Procedure Needed

The proper Michigan BankAmericard procedure for changing account billing dates is certainly quite lengthy. There are four separate steps different staff members handle from the time a request for a specific change is received:

- A letter must be written telling the card holder that he will have to contact a second office repeating his request and that he must return his actual credit cards along with the request.
- The second office, after receiving and reviewing the repeated request, must inform the card holder there is a potential loss of credit history involved if his request is honored.
- The old account must be closed.
- That the old account is closed must be confirmed and then a new account opened.

Whether this is, as Nilson and Tobin assumed, an unnecessarily cumbersome procedure was quickly decided by comparing it with the procedures suggested by Tobin (which have been tested in actual use, he told me).

The Tobin procedures (detailed in the box), permit the original recipient of the request to initiate the change as quickly and easily as he could write a letter refusing to make the change.

No other staff work in the same department or in any other bank departments is needed.

Credit-history details are transferred from the old account to the new account.

The Tobin method provides for more than one number to be used simultaneously for charging or for payments. It just shifts all the entries received for the first account into the new account and makes the necessary adjustments automatically.

So, there is no need to delay until the receipt of the old card or to get fouled up when a card holder gets a charge on the old account number because a dealer hasn't sent in charges promptly or for any other reason.

Tobin told me most of these procedures are already built into the system to provide for effective handling of the standard lost-card situation. So the additional costs should be minimal – provided the consumer advocate philosophy has been followed.

Certainly, the ease of the internal system would make it very unlikely anyone wouldn't honor customer requests for such changes, and this contrasts favorably with the present Michigan BankAmericard system.

Based on this system, it looks as though the Michigan BankAmericard system is unnecessarily cumbersome and, like other inflexible systems, can result in an appearance of corporate arrogance no one wants and nobody has authorized.

Indeed, it seems consumer sensitivity may well be the missing function from systems design training. This is needed to stop the "blame the computer" syndrome everyone dislikes, but few do anything about.

Some Recommendations for Michigan BankAmericard

- Permit the entry of a status-change request for a new billing date.
- Automatically transfer the balance and history to a new account number in a cycle near the requested date. This can be handled in the posting program.
- Mark the original account with the new number so subsequent transactions can be posted to the new account.
- Issue cards with the new account number.

These recommendations on methods by which Michigan BankAmericard could improve its handling of requests for billing changes were provided by Bertram Tobin.

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A 'Project Which Failed' Story

Standardization Effort Can Be Just a Rude Awakening

By Miles Benson
Special to Computerworld

Standardization is a glorious thing.

A company with branches in Walla Walla, Kokomo and Azusa can install the same computer hardware in all three locations and shift the overload from any one of them to one of the others.

Even better, if the programs for the standardized hardware are also written in a standardized language, then programs from any location can be used and/or maintained somewhere else.

The Sociology of Computing

It's a simple and well-known concept, and most companies are aware of it, using it whenever they can.

Whenever they can? What possible excuse is there for not using it all the time?

Well, the answer to that question leads up to an interesting "Project Which Failed" story.

Ring-A-Ding Tel and Tel is a company with offices in so many towns and cities that the list makes Walla Walla, Kokomo and Azusa look like major metropolises. When Ring-A-Ding decided to standardize and put a Mellowtronics 3PI computer into each major center across the country, it ran into one little standardization snag.

While most of the centers had Mellowtronics 3PIs already, and those that didn't were happy to run right out and order one, the Audible Chasm, Nev. branch, didn't want to go along.

There were a couple of key reasons. For one, Audible Chasm had just completed the installation of a Generation Four Quadranova computer, which had cost a small (actually, large) fortune and was considered by many to be a light year and a half ahead of the Mellowtronics, technologically.

For another, Audible Chasm was filling in its third-shift time with a family of time-sharing, game-playing programs which were receiving major play at the nearby Microchip Casino, and the income from that Nevada-legal opeation was high enough that, although Ring-A-Ding blushed at the source, no one was about to un-plug the capability.

Well then, there's a simulated-real-world answer to the question, "What possible excuse is there for not standardizing?" The whole answer may not be obvious, but the first letter is a dollar sign.

That takes care of the generalized question. But what about this particular problem? How did Ring-A-Ding get past the Audible Chasm dilemma?

One Standard Further

Fortunately, Audible Chasm has on its staff some technologists with a goodly quota of smarts who weren't above brainstorming their way to New Solutions. The Audible Chasm technologists sat down together, scratched their collective heads and came up with an Idea.

"What if," they said, "Ring-A-Ding not only standardizes on the Mellowtronics 3PI hardware, but also standardizes on a programming language, like PL/PI? Then those of us who can't go the Mellowtronics route can still go the PL/PI route, and we'll code up a storm in PL/PI on our Quadranova, and our programs can be shared at the source level, if not the object level, with all the other Ring-A-Ding sites."

It all sounded feasible, except for one remaining computing clinker – Generation Four didn't provide PL/PI for the Quadranova. And that silenced the brainstorming session for several microminutes.

"Hark!" exclaimed the Audible Chasm software engineering manager into the gathering gloom. "Why don't we build a PL/PI compiler to the Mellowtronics specs for our Quadranova, and that will solve the problem?"

No one could think of a real reason not to. Software Engineering had no compiler people, of course, but the software engineering manager said he had some red-hot contacts at the University of Nevada at Audible Chasm (Unac), where some of the sharpest software folk in the academic world were know to reside.

When he said he thought a couple of them could be lured away to work on a lucrative and interesting assignment, the last spark of opposition died down.

The plan, boiled down to industrial world terms, was:

1. Sell the concept to Ring-A-Ding nationwide. (Since the compiler cost was considerably less than the Microchip Casino revenue added to the Quadranova replacement cost, this looked to be no problem.)

2. Hire some compiler people from Unac.

3. Start work on a PL/PI compiler.

The plan was appropriately blessed, life was breathed into it financially, the compiler people were hired and work began. Smoothly, and with enthusiasm.

Well, there *was* this one other problem. Schedule. Ring-A-Ding nationwide expected to be on the Mellowtronics by the second quarter of the following year. Could the Quadranova PL/PI be ready by then?

That called for consultation with the ex-Unac folk. And before I tell you how that consultation came out, I need to lay a little background material on you.

Elephant of a Language

First of all, PL/PI is an elephant of a language. It has a trunk full of data types, more operators than your average Ring-A-Ding switchboard and a nested block structure that puts a barn swallow to shame.

In short, PL/PI cannot be taken lightly. Building a PL/PI compiler is a shirtsleeves-rolled-up, programmers-locked-in-a-quiet-room kind of business.

My second piece of background material is that, for all their software prowess, the Unac folk had some academic naivete. They had built some pretty wonderful programs which were in use nationwide. Their Mellowtronics S-level assembler, for instance, was an intricately woven fabric of coding perfection, and it performed circles around Mellowtronics' own company-issue assembler.

And their Monster Basic processor was known far and wide as the classiest, biggest and fastest Basic processor in the world.

But assemblers and Monster Basics are one thing, and PL/PIs are something else. The academic world seldom gets heavily involved in a shirtsleeve project that takes more than a semester or two to build. And that, in turn, accounts for the academic naivete I mentioned earlier.

With that groundwork laid, let's get back to the mainstream of the story. The question was, could the Unac software types build a PL/PI compiler by the second quarter of the next year?

The answer which came back was: "Heck, yes."

And the seeds for a "Project Which Failed" were sown.

I will spare you the details of the awakening which slowly followed. But, as time passed, Audible Chasm became painfully aware the appointed time would come and go without the standardization being supported at its site.

On the day in question, the Unac folk had an elegant parser for the full PL/PI language. But nothing more. The rest of the Ring-A-Ding world swapped programs, and level-loaded their computers, and just standardized up a storm.

But Audible Chasm and its Generation Four Quadranova were left on the outside looking in; parsing, but definitely not compiling.

You know, I really don't know how the story came out. Come to think of it, this may not be a "Project Which Failed" after all. Audible Chasm and the ex-Unacs may have worked nights and weekends and finished up the Quadranova PL/PI on some kind of better-late-than-never compromise schedule.

But, somehow, I doubt it.

Standardization is a glorious thing.

But getting there is sometimes too painful to bear.

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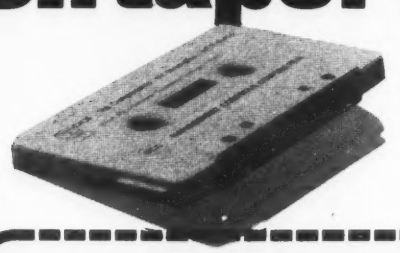

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Atlanta Scene of CPE Meet

By Don Leavitt
Of the CW Staff

ATLANTA – The movement is spreading. There will be a one-day meeting of regional users interested in computer performance evaluation (CPE) here at midmonth.

The session is set for Monday, Aug. 18, at the Radisson Olympic Inn, starting at 8:30 a.m. and running until the late afternoon. It is being sponsored by the Comress division of Comten, Inc., and attendance will be limited, although use of Comress tools is not a prerequisite.

Thus the locale is different – earlier regional meetings of CPE buffs were held in New York and Chicago – and the sponsor is different – the other sessions were sponsored by the Computer Measurement Group.

But the basic goal is the same – to give users a rather informal means of comparing notes about the tools and techniques of CPE, according to Bob Bishop, local Comress representative who is organizing this meeting.

The meeting will include presentations by invited users describing their experience in CPE, including use of both hardware and software monitors and related measurement packages.

The featured speaker will be Jack Mellies, project leader for CPE at Caterpiller Tractor in Peoria, Ill.

Unlike the sessions run by the Computer Measurement Group in New York, the Atlanta meeting will not be designed around audience-participation workshops. Although that approach may be used in follow-up meetings here, it tends to be too informal for an initial session, Bishop said.

Echoing the thoughts of the organizers of the earlier CPE meetings, Bishop said he was torn between a desire for a big turnout and an awareness that sheer size can stifle a working group. To resolve his dilemma, he asked users interested in attending the session to contact him as soon as possible at Comress' regional office, 2480 Windy Hill Road, Marietta, Ga., 30062.

'DYL-260' Speeds Report Tasks For California Supermarketer

Special to Computerworld

LA HABRA, Calif. – With more than 260 supermarkets, 30 restaurants, 10 drugstores, and six discount centers, Alpha Beta Co. requires a large number of special reports for management in addition to its routine data processing.

Inventory control, pricing analyses, promotions, Universal Product Code and many other reports are regularly handled by the company's extensive DP center.

Cranking out data when it's needed greatly affects the company's reaction time to changing conditions, especially in an era of rapid inflation.

Tight Controls

Because of tight controls and procedures for programming, Alpha Beta had to find a software package that could give almost immediate turnaround without having to go through the normal procedure of fully documenting each program.

Alpha Beta chose DYL-260, a report generator and data management package from Dylakor Software Systems, Inc.

Easy for the Inexperienced

"We have so many special requests we needed to find a way to be responsive, but better utilize our resources – take people that were inexperienced and in a short time have them write a program with DYL-260 and not tie up programmers.

"We have done this and are turning out reports that are not only important, but enable us to keep up with a host of requests reflective of the time we live in," according to Phil Cote, division system coordinator for retail operations and merchandising.

"The package has automatic report-writing features that include composing the report layout. We have cut our turnaround substantially," he added.

Alpha Beta's MIS director, John Womack, said "larger installations are going to be variable-length rather than fixed-length files. Most report generator packages just haven't addressed this problem.

"By using a software package like DYL-260 that can access variable length files, the whole process can be shortened and you have a lot of flexibility."

Wide Range of Uses

"We use the Dylakor package for a wide range of applications," Cote said. "To illustrate how important the software is to us, Value Fair (recently acquired by Alpha Beta) is converting to Alpha Beta's procedures.

"We're using DYL-260 to make some of the conversions related to inventory control files while, at the same time, still maintaining their file for merchandising reports," he explained.

"We became interested in this software package when searching for an easy way to extract data from SMF," reported Terry Thomas, who is in charge of technical systems. "The full mathematical capabilities, automatic report formatting and file-processing flexibility made DYL-260 an ideal choice.

"When we started evaluating new packages, we looked at time-sharing programs, special-purpose systems, financial data base models and a report generator," Cote recalled.

And Thomas added, "The product is relatively new within our installation, but already application coordinators [systems analysts] are using it to produce programs in a fraction of the time our PL/I-oriented staff might take."

Alpha Beta employs about 100 people in its DP center and has recently installed a 1M-byte IBM 370/158 to replace a 370/145.

'Control/IMS' Tracks DBMS Use Costs

SUNNYVALE, Calif. – Installations working with IBM's IMS or IMS/VS data base management system (DBMS) may gain insight into the cost of using the system and ways to hold those costs in check with the Control/IMS package now from Boole & Babbage, Inc., (B&B).

Developed by Morino Associates, the package is said to help users in several ways. It is a financial management tool which aids in developing and distributing IMS usage costs, thus providing, according to B&B, an accurate picture of the cost of doing business with IMS.

Control/IMS is also an installation management tool that provides the data needed to control "an almost unmanageable or runaway situation," the vendor said without elaboration.

Operating measurements beyond those normally provided by IMS log or monitor functions are coupled with analysis routines to permit software support, data base administration and application programming personnel to improve their use of the IMS system resources.

Finally, B&B noted, the package is a planning tool since it allows more accurate predictions of future requirements, based on definitive information about the past.

While it provides data not collected by conventional IMS functions, the measurement interface built into Control/IMS is said to have "minimum impact on system performance." The reporting and analysis facilities of the package turn the data collected into trend, growth pattern and saturation level information.

Control/IMS can be acquired for $14,000/year for a single CPU or $16,000/year for a multi-CPU site from B&B at 850 Stewart Drive, 94087.

On-Line Systems Net Reaches Into Canada

PITTSBURGH, Pa. – On-Line Systems, Inc. has expanded its communications network to Toronto to provide remote computer service to customers in Canada.

The Toronto service brings to 19 the number of cities in North America linked to the company's computer center here.

In addition, On-Line Systems supports Inward Wide-Area Telephone Service (In-Wats) elsewhere on the North American continent. The firm is at 115 Evergreen Heights Drive, 15229.

'Panvalet' Facilities Extended

OAK BROOK, Ill. – IBM source library and Job Control Language (JCL) maintenance is easier than before with enhancements included in Version 9 of Panvalet, the program management and security system from Pansophic Systems, Inc., according to a vendor spokesman.

A modular system, Panvalet has been modified in its basic routines to include a Delete command and a Scan/Replace facility that works in conjunction with the update facilities from prior versions.

A Resequence command provides easier user control over sequence numbers of stored programs, the company said.

An Extended Feature Facility (EFF) allows the user to tailor the Panvalet environment through a choice of options. EFF can be used under either programmer or managerial control.

For the OS-oriented installation, a partitioned data set (PDS) processing facility has been included. This amounts to a interface that links Panvalet with any card image PDS.

Also in OS, an Execute processor allows users to transfer control, through Panvalet, from one program to another without incurring additional OS overhead.

Generates Commands

The Panvalet Group Processor (PGP) generates commands so users can perform functions on groups of members as well as individual members of the library.

In conjunction with PGP, a generic naming ability allows access to all programs with specific prefixes, suffixes or other strings of characters in a name.

In DOS operations, Version 9 has a console input extended feature allowing use of a SYSLOG device for interfacing with a Panvalet library. This can be useful in setting up a JCL library and is similar to an internal reader capability.

The updated package is available for $4,980 (DOS) or $5,580 (OS) from the vendor at 1301 W. 22nd St., 60521.

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File, Library Backup, Copying Optimized With 'Save/Restore'

FORT LEE, N.J. – IBM DOS and DOS/VS shops can perform disk backup, conversion and maintenance tasks with "unprecedented speed and flexibility" by installing the Save/Restore utility from Oxford Software Corp., according to a vendor spokesman.

Developed by Generic Systems of Jacksonville, Fla., the package includes several features that allow it to operate "significantly faster" than other, similar software. Perhaps most significant, Oxford said, is the user's ability to copy files and libraries on a selective as well as a volume basis.

Selective transfers in general avoid the time required to save entire packs (as required by IBM's Fast-Copy routines, Oxford noted). But Save/Restore saves even more time and space by copying only to the end-of-file marker, not to end of a file's allocated space.

The unused Extents of some disk files may account for as much as 60% of the file's space, so the savings made possible can be significant, the vendor said.

The Oxford package allows files and libraries to be saved from one disk location and restored in another, permitting easy disk reorganization. The library copying requires only one pass.

Condensing of IBM libraries during restore operations is said to be 10 to 20 times faster with Save/Restore than with IBM's Maint routine, and the Oxford package works with any combination of IBM-compatible disk types.

Save/Restore is available now for DOS users at $2,000 and for DOS/VS users at $3,000, Oxford noted from 1567 Palisades Ave., 07024.

Interdata Minis Supported

Users of minicomputers from Interdata are beginning to see more software support from outside vendors.

Diversified Data Systems, Inc. (DDS) of Tucson, Ariz., recently announced support for its Cobol compiler on the Interdata 7/32 and 8/32 minis, as well as on the 7/16.

DDS' Integrated Business-Oriented Language Support (Ibols-32) – operating under Interdata's OS-32-MT environment – includes ANS Cobol facilities above Level 1 of the standard, support for Indexed Sequential Access Method (Isam) files and a sort/merge facility.

Meanwhile, Computer Dynamics, Inc., of Hartsdale, N.Y., has also completed development of an Isam support package for the 7/16 and 7/32 and expects to have it ready for delivery in the early fall.

The Isam support software, which sells for $1,000, will provide users with file capabilities comparable with those available on full-scale mainframes, the company added from 25 Rockledge Road, Hartsdale, 10530.

Cobol facilities available through DDS' Ibols-32 include features from the Debug and Interprogram Communications Modules of the 1974 ANS standard, plus CRT data entry support.

A library directory system, "IBM-type aids" and various support subroutines are also included, DDS said.

The earlier Ibols-16 package now includes a COS multiprogramming operating system supporting 16 partitions and a source library manager.

License fee for the entire Ibols-32 package, set for delivery in mid-August, is $12,500, and can be arranged through P.O. Box 50505, Tucson 85703.

Mini Text 'Editor' Uses CRT, Cursor

NEW HAVEN, Conn. – The Editor package from Systems Technology, Inc. (STI) is an interactive, CRT-based, on-line text-editing system for users of the Data General Nova and Eclipse and Digital Equipment Corp. PDP-11 minicomputers.

Editor treats the CRT screen as a "window" through which the user may view a piece of a text file. The software also allows the user to move forward or backward through the file to find the specific piece of text needed.

Within the CRT "window," a cursor indicates the position at which editing will take place. Special keys move the cursor, allowing the operator to edit any part of the file shown on the screen.

Edit functions are said to include character or line insertion and deletion and text replication, each triggered by a single keystroke command.

Editor utilizes a "scratch-pad" mode of operation which enables the user to recover from an unintentional deletion or to rearrange the file quickly if an insertion is made in the wrong place.

Editor runs under Data General's RDOS or DEC's RSX-11 environment and will support most CRT terminals, including Data General's Display and DEC's VT05 and VT50 units.

Distribution of the binary-coded Editor logic is made under a license agreement for a one-time charge of $500. Update service is available for an additional fee, STI noted from 405 Orange St., 06511.

Selective Print Routine Aids 360/370 Debugging

WICHITA, Kan. – Developed by MMI Software, MMISPU is a selective print utility intended primarily as a debugging aid for IBM 360/370 users working in real or virtual storage environments.

The routine reads Qsam, Qisam and Bdam data sets and prints all records with fields meeting any combination of user-specified relational conditions. The conditions may be combined with Boolean logic operators and up to 15 conditions may be specified at one time.

In a single run, MMISPU can read and, if appropriate, print fields stored in a variety of data formats, the firm said. The standard printout is similar to an Abend dump, a spokesman noted, but added that a "character-only" format may also be selected.

Priced at $300, MMISPU can be ordered from MMI Software through P.O. Box 1399, 67201.

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Required Effort Worthwhile

Current Report Writer Status Likened to Early IOCS

By Robert Higgins
Special to Computerworld

Having just discovered a slightly scary bug in our Cobol compiler's handling of Report Writer page-heading groups, I'd like to respond to William Simmons [CW, June 18].

Any discussion of the Report Writer module must begin by agreeing that the facility *is* different from most of Cobol, in essence and in detail. It is much more implicit, nonsequential and interrupt-oriented.

In its features and the effort needed to use them today, the Report Writer is analogous to the Input/Output Control System (IOCS) data management routines of the mid-1960s (in fact, the Codasyl *Cobol Journal of Development* uses the acronym "RWCS" – Report Writer Control System.

Both are intended to submerge a sizable amount of standard but subtle code. Report Writer interrupts detail processing to handle control- and page-breaks, whereas IOCS interrupts logical record processing to handle physical I/O and label checking.

The analogy is strengthened when we consider that both Report Writer and IOCS use declaratives and – from the viewpoint of the main program – USE BEFORE REPORTING is just as "unpredictable" in its timing as USE AFTER STANDARD BEGINNING LABEL PROCEDURE.

Also, the syntax for both facilities is primarily descriptive and in the Data Division, rather than imperative in the Procedure Division; we leave it to the compiler to work out the standard, but sometimes complex, implications of our description.

Most of Simmons' reported explanations against using Report Writer were reminiscent of the arguments against early IOCS packages – 'inefficient' and 'uses too much core' especially so. The transition from handwritten (unlabeled, unbuffered, unblocked) I/O coding to IOCS was demanding, but look what we gained!

Who now would seriously propose hand-coding all the physical I/O logic for polling a multidrop mixed-device inquiry network and accessing an integrated data base?

Let me offer several comments on details of Report Writer and its present status:

- The standard implies (and some compilers insist) that Report Writer is only for printer files. This is a regrettable limitation, since summary files on other media are often useful components of a system.
- Limited use of Report Writer on many machines has delayed the "shakedown" process, leaving many compiler bugs undiscovered. The implicit nature of Report-Writer magnifies this problem. Hopefully the Federal Cobol Compiler Service Validation routines exercise Report Writer features thoroughly.
- Report Writer syntax does not allow reference to carriage-control tapes. That implies that reports with extensive vertical formatting (such as preprinted forms with page totals) would likely run much slower under Report Writer since positioning would, by default, have to be implemented by spacing rather than skipping.

We should campaign to increase the visibility and use of Report Writer by tutorial articles and demonstrations for a very expedient reason: in its present underutilized state, it is more burden than benefit (compiler complications, program maintenance skills, etc.).

If compilers are inadequate or unreliable, bring it strongly to the vendors' attention – if the feature itself is deficient or obscure, petition Codasyl.

If such a campaign fails, we should seriously reconsider the Air Force proposal to abolish Report Writer.

Higgins is a systems analyst with First National City Bank, New York City.

350 is the shape From Sycor.

The first thing you'll notice is the way we've integrated the exclusive Sycor dual flexible disk into our compact Model 350.

But there's more to the Model 350 than meets the eye. It's also the lowest cost flexible disk intelligent terminal on the market.

And we've equipped our Model 350 with 16K bytes of programmable memory. Plus a powerful new language called TAL II, so you can custom-tailor programs to meet your own unique requirements. This, along with 500,000 characters of flexible disk storage, makes the Model 350 the first step to remote data base management.

Cut keystrokes by 50% and watch data entry costs go down.

Think what the Model 350 can do in your sales order entry applications. It lets you store customer, product/price and salesman files right at the source. Or use it to retrieve data, maintain and update files—even to generate reports.

Just key in a code number and the product name appears with all the pertinent data. Key in another number and you retrieve your customer's name, address and billing information. All of which means reduced keystrokes for your operator, improved accuracy for you.

An intelligent solution from the Intelligence Pioneer.

The Model 350 is the latest in a line of terminal products that started with the Sycor Model 340, the most versatile intelligent terminal around.

Today, there are more than 25,000 Sycor-built terminals in use in 38 countries around the world. In North America alone, we maintain our equipment through 95 service centers, staffed by over 400 skilled technicians.

For more information on the Model 350, contact your Sycor representative. You can get delivery in 60 days.

For more information on things to come in the field of remote data base management, keep an eye on Sycor.

SYCOR

...used by half of the Fortune 500 companies.

'Cotune' Plots Cobol Code Use

By Richard Watson
Special to Computerworld

In his article, "Preprocessor Can Boost Rework Efforts" [CW, July 16], Arne Rohde described a very desirable concept for a Cobol preprocessor.

I have tested a Cobol preprocessor called Cotune II which provides every function Rohde mentioned, plus some. Without any manual effort, Cotune establishes execution counters for each paragraph and, more important, each verb within the procedure division.

In statements with multiple verbs, the statement is split so each verb execution can be evaluated independently.

After execution it removes all counters. The source listing is basically unaltered. Beside each statement Cotune prints the number of executions and the percent of time spent executing that verb.

The percent of time spent is shown in decimal format as well as in a histogram. This allows easy spotting of both the most frequently used paragraph (by statements) and the most time-consuming.

Cotune also prints two lines bracketing the statement where an abend occurs.

By using the counts it is possible to develop a good "educated guess" of the program flow. In any event, one knows exactly which paragraphs and/or statements need to be optimized.

I also found it useful in detecting loop situations, inefficiencies caused by the order of multiple "IF statements and subscripted table searches.

Cotune prints two summary reports – one listing all unexecuted paragraphs and one which provides an execution time summary of all executed paragraphs by percent of total runtime and execution time in seconds.

The Cotune package is marketed by Capex Corp.

Watson is with the U.S. Department of Commerce, National Oceanic and Atmospheric Administration.

When a computer goes down, it can put a lot of people out of work.

Anyone who has a computer will tell you it breaks down now and then. The problem is, when the computer stops working, so do all the people who depend on it.

So if you have to keep your operations going no matter what happens to the computer, we suggest you buy a Data General system with two computers in it. Then, if one goes down, the other one can keep you going.

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And on some of our single processor systems we even offer options like Automatic Error Checking and Correction. It keeps the computer going by automatically detecting and correcting all single bit memory errors.

Data General computers are less likely to break down because they have fewer interconnections than most computers. But if one of our computers ever does go down, you can call in your local Data General service representative. All the major functions of our computers are on separate modules so it's easy for him to locate problems, and easy to correct them.

So if you don't want to be let down by your computer, put in a call to Data General.

That way, you won't suddenly find yourself out of work.

DataGeneral

Data General, Route 9, Southboro, Mass. 01772 (617) 485-9100. Data General (Canada) Ltd., Ontario.
Data General Europe, 15 Rue Le Sueur, Paris 75116, France. Data General Australia, Melbourne (03) 82-1361/Sydney (02) 908-1366.

COMMUNICATIONS

Multichannel Controller Expands Univac Series 90

BLUE BELL, Pa. – Univac has introduced the Multichannel Communications Controller (MCC) to expand the communications capability of its Series 90 systems under the Virtual Memory Operating System/9 (VS/9).

The controller utilizes the design principles of the earlier 3760 communications controller as well as current VS/9 software.

The MCC supports VS/9 communications control by emulating the Communications Controller Multichannel (CCM), providing the CCM's full functional capabilities.

Improvements include support of more higher-speed lines and a wide mix of line speeds, disciplines and protocols, including Univac and industry-standard terminals and high-speed computer-to-computer data communications.

Throughput Increased

Peak throughput is increased to a maximum of over 25,000 char./sec. The MCC can accommodate line speeds from 45.45 bit/sec to wideband speeds of 56 kbit/sec.

It can also support up to eight line speeds concurrently and be used with up to 59 lines, depending on the number of subchannel registers available on the host processor, Univac noted.

The MCC is available for the 90/60 and 90/70 systems. Use of integrated circuits allows a 32-line MCC to be housed in a cabinet about the size of a desk.

The controller is said to use less power and dissipate less heat than older second- and third-generation equipment.

Simpler Modification

The MCC also provides users with a simplified procedure for modifying a network. Network definition is accomplished via a system generation procedure allowing lines or line types to be easily added, the company said.

The smallest model MCC can be upgraded in the field to fuller capabilities as communications requirements expand.

The MCC is available in three versions. Model 1 accommodates up to 16 half-duplex or full-duplex lines. The dual-scanner Model 1A handles an additional 16 half-duplex or full-duplex lines; the Model 2 can be used with up to 59 half-duplex or 29 full-duplex lines.

MCC Functions

Operating under host processor control, the MCC performs such functions as character sequence detection or insertion; code translation; cyclic, longitudinal and vertical redundancy character generation on transmitted messages; and checks for such characters on received messages.

The controller also performs automatic dialing and answering and interfaces a wide variety of common carrier lines.

A Test Assistance Program (TAP) allows customer engineers to test individual lines, line adapters, modems and terminals without interfering with production communications processing. New lines and terminals can be verified without using host processor time or taking all communications off-line.

A typical MCC may be leased from $1,266/mo, including maintenance, for a Model 1; and up to $2,669/mo, including maintenance, for a Model 2.

Purchase prices range from $58,536 to $122,764 for typical configurations. First deliveries are scheduled for November.

Randal Has 2740-Type Terminals

TORRANCE, Calif. – A series of printer terminals has been added by Randal Data Systems, Inc.

Developed by Diablo Systems, Inc., the RDS-1550 series includes a model that is fully compatible with IBM's 2740 Model 2 terminal.

The RDS-1552 is a microprocessor-based, IBM-compatible terminal with many standard features said to be unique in its price class, plus a number of user-oriented options.

Standard features include built-in operator interactive diagnostics; error detection and isolation; print buffer with 768 characters providing block transmission in the 2740 Model 2 discipline and automatic bidirectional printing; conventional and absolute forward and reverse tabbing; and variable motion index for text line justification; and infinite plotting capability.

Other models of the RDS-1550 series communicate in Ascii or APL through a standard RS-232C interface. Available options include a choice of type fonts for the Diablo print mechanism, forms tractor, forms stacker, answer-back and a work surface extension.

Options planned for the near future are floppy disk storage, polling adapters and communication network controllers and text-editing firmware, the company said.

The RDS-1550 costs $5,050 or $188/mo rental while the RDS-1552 costs $5,500 or $202/mo.

Purchase prices for options are paper stacker, $85; forms tractor, $225; answer-back, $300; and work surface extension, $60.

Delivery is described as off-the-shelf from 2807 Oregon Court, Building F, 90503.

Phone Service Up, Bills Down With Watsbox

DALLAS – Hallmark Cards, Inc. recently installed Action Communication Systems' Watsbox and, according to Pat Springer, Hallmark manager of corporate communications, "the Action system is already exceeding the company's expectations."

Following installation at its Kansas City, Mo., headquarters, Hallmark personnel experienced improved telephone service and shorter waits for Wats lines.

Data which provides call patterns and direct dialing expenses by department is another benefit. "We expected the usual problems and bugs associated with the installation of any complex equipment," Springer said. "However, only minor problems have occurred and these have been solved satisfactorily by Action's maintenance group."

The computer-controlled communications system is coupled with economic benefits, including the transfer of two operators previously required to man the Wats switchboard and a reported 55% savings on annual direct distance dialing.

Other benefits noted were a 20% cost reduction in Wats usage charges and an estimated 28.8% rate of return over the life of the equipment.

The Watsbox operates through a minicomputer which monitors and matches all call requests with the least expensive method of routing. The system interfaces to the firm's previous communications system through the use of Bell Voice Connecting Arrangements.

Each Hallmark employee attempting to dial long-distance is automatically checked (through validation of an authorization code) to insure he is authorized to make the call. Unauthorized callers receive an error tone and are disconnected.

When the Watsbox receives an authorized call request, it simultaneously analyzes the most economical way to place the call, checks for system malfunctions, continues monitoring other calls and records all long-distance call information for billing purposes and future system analysis.

Only authorized Hallmark personnel are allowed to access Direct Distance Dialing (DDD). The authorized caller receives a short warning tone letting him know the Wats lines are not available and his call will overflow to DDD.

The caller then has the option of hanging up and placing his call later at a lower cost if the call is not urgent.

The caller knows the Watsbox will record the authorization number of the person placing the call, the date, the time, the type of line used and the duration of the call. This magnetic tape capture feature acts as a deterrent to placing unnecessary or lengthy long distance calls.

Lundy Interactive Display CRT Needs No CPU Refresh Overhead

GLEN HEAD, N.Y. – Lundy Electronics & Systems, Inc. has introduced a refresh-type interactive graphic display.

The terminal is buffered and requires no overhead in the CPU for refreshing the CRT, the company noted.

The System 32/200 is available with a four-color presentation (red, orange, yellow and green) as an option. Vector drawing speed is 1.4 in./μsec. Character drawing speed is 4.8 μsec average.

Standard features for the System 32/200 include a programmed character generator (96 individually stylized characters and symbols in either Ascii or Ebcdic); 4K by 16-bit refresher core memory; 16-key function keyboard; light pen; a rectangle generator which draws a rectangle with selectively blanked sides; reflection and rotation of subsets; and a subroutine capability with 8 comparison bits and 16 levels of save address push-downs.

Available options include circle and eclipse generators; three-dimensional rotation and transformation generator; expanded character generator with 192-character set; user-defined special symbols; 32-key function keyboard; and alphanumeric keyboard.

Refresher memory expansion to 32K words, up to four additional display consoles, data tablet, trackball, joy stick and interfaces to all popular 16- and 32-bit minicomputers are also available.

Corresponding software for integrating the graphic displays is available.

The system costs $55,000 to $80,000 depending on options. Delivery is four to six months from Dumond Place, 11545.

Van San Covers Telex, Teletype

CITY OF INDUSTRY, Calif. – Van San Corp. has introduced the Model 4404 acoustic terminal cover designed for the Teletype 33 and Telex 32 ASR/KSR.

Model 4404 is a floor model which fits the terminal's contour and noise output.

The unit costs $339.50 from Van San at 1180 Centre Drive, 91748.

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The Sycor 440 control unit handles background processing, including remote job entry, file maintenance, report generation and multiterminal printer support, while data is being entered in the foreground.

Multikeyboard Sycor 440 Allows Data Entry, Inquiry/Response Use

ANN ARBOR, Mich. – Sycor, Inc. has unveiled a multikeyboard, shared-processor communications system – the Sycor 440 – for use in networks with its stand-alone intelligent terminals.

The Sycor 440 clustered terminal processing system features data entry with concurrent processing and shared files for inquiry/response applications.

The system includes a central processor with 5M- and 10M-character fixed disks, up to eight video display terminals, cassette or flexible disk interchange media and a variety of peripheral devices including line or matrix printers, magnetic tape drives, card readers and both binary synchronous (1,200- to 9,600 bit/sec) and asynchronous (75- to 1,200 bit/sec) communications.

Transmission is in Ascii or Ebcdic using longitudinal or cyclic redundancy checking.

TAL II, an enhanced version of the company's Terminal Application Language, may be used to custom-tailor data entry with arithmetic operations, conditional data entry, range checking, table lookup and a variety of other intelligent functions.

Terminal Transactions

Each CRT display operator can access common files to select constant data to support data entry and inquiry/response applications.

The display consists of 576 5 by 7 dot matrix characters on an 8-line by 64-character format with a 64-character status line. An optional feature allows control characters to be blanked out and field labels dimmed.

Concurrent with data entry and inquiry/response, the Sycor 440 offers background processing including remote job entry, file maintenance (editing, sorting, updating and file transfer), report generation and multiterminal printer support to allow each display to interleave data blocks to one printer while data is being key-entered.

The 440 is software- and communications-compatible with the company's Model 340 and Model 350 intelligent terminals and may be used to receive and transmit data to Sycor's stand-alone terminals or other Sycor 440 systems.

The system can also communicate with mainframe computers, emulating IBM 2770, 2780 or 3780 protocols.

A single terminal system is priced at $535/mo on a three-year lease and $632/mo on a one-year lease; the purchase price of the unit is $22,250.

A four-terminal system is priced at $677/mo on a three-year lease and $797/mo on a one-year lease; the price is $29,090.

An eight-terminal system is priced at $894/mo on a three-year lease and $1,050/mo on a one-year lease; the purchase price is $38,660.

All lease prices include a 5M-character disk, cassette, communications and maintenance.

Delivery is expected in the first quarter of 1976, Sycor said from 100 Phoenix Drive, 48104.

Paradyne Adds Series Of All-LSI Modems

LARGO, Fla. – Paradyne Corp. has introduced three all-LSI modems which operate at 4,800-, 7,200- and 9,600 bit/sec.

The data sets are designed for four-wire point-to-point synchronous transmission networks and are said to provide a 70% size reduction over conventional modems.

The LSI-48 operates at 4,800 bit/sec and costs from $2,500 to $3,000 per unit; the LSI-72 operates at 7,200- and 4,800 bit/sec and costs from $3,400 to $4,000 per unit.

The LSI-96 transmits at 9,600-, 7,200- and 4,800 bit/sec and costs between $4,000 and $5,000 per unit. This is described as up to 50% less than units comparable to the LSI-96.

The modems operate on Bell type 3002 lines with D1 conditioning in full-duplex binary serial transmission. They include EIA RS-232 or other common interfaces. and each has status lights and test indications to assist the operator.

Paradyne is at 8550 Ulmerton Road, 33540.

There are two ways to convert to OS.

Converting to OS? There are two ways to do it. One is drastic and disruptive. The other is UCC TWO.

Without UCC TWO, changeover is a long-run nightmare. You have to re-write old programs while you try to design new ones. Months of solid confusion, hard work and down time. And one big, sudden expense. It's a good way to get burned.

With UCC TWO, it's business as usual. You continue to use your DOS programs —without reprogramming—while you make the conversion. You can plan the conversion to fit your work schedule, instead of the other way around. No re-IPLing from system to system. In fact, you can even spread the job over months. And you can spread the cost. Pay as you go.

The choice is yours: Chaos. Or UCC TWO.

UCC TWO is one of the advanced software systems from the leader in operating software—UCC. Like you, we know there's more to software than installation. That's why we're the leader in long-term service and support, too.

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☐ UCC SIX (PDS Space Management). Automatically inventories and controls OS disc space. Minimizes PDS compression requirements and disc investment. Saves programmer and machine time.
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Choice Widens for Univac Peripherals

•Add-On Memory

By Patrick Ward
Of the CW Staff

PAOLI, Pa. – The Imperial Technology, Inc. (ITI) line of plug-compatible, add-on memories for Univac CPUs is said to offer 32K-word increments, rather than the Univac 64K-word memory increments; reduced floor space requirements; and superior mean time to repair, at a price one-quarter to one-third less than Univac-supplied memory.

The ITI 4000 line includes main storage for Univac 494, 1106 and 1108 computer systems and extended storage for the large-scale 1110 systems.

ITI, based in El Segundo, Calif., manufactures the core memory using modules from Electronic Memories and Magnetics.

Corporation III, a marketing management firm here, is the exclusive distributor of the add-on memory for the U.S. and Canada.

Corporation III has signed Sorbus, Inc. to provide maintenance for the memory on a third-party basis. Univac has said it will continue to maintain systems that add the foreign memory, provided the systems retain some Univac memory so the mainframer can run comparative diagnostic tests.

Univac also said it wants reimbursement for any damage to its systems caused by the foreign memory, and added it will not change its hardware or software to accommodate such foreign memory.

Requires Minor Modifications

Corporation III said use of the 32K-size increments requires only minor software modifications to the Univac system. The 64K memory blocks are "completely transparent" to the processor, a Corporation III spokesman said.

The ITI is said to require less than one-third of the space needed by equivalent Univac memory, an "important feature in user locations that lack extra space near the CPU," the spokesman said.

Use of only two replaceable types of cards – an interface card (one for each 32K) and a memory card (four for each 32K) should make for quick repairs, Corporation III said.

The memory comes in cabinets containing up to 64K. Interleaving is provided between 32K banks, and two access ports give multimodular access capability. The memory is expandable to 256K words in a multiple-cabinet configuration.

Cycle time for the Model 4000 is 1.0 μsec or 1.5 μsec/word for 1106 main memory and 750 nsec/word for 494 and 1108 memory, equivalent to Univac main storage.

Extended storage cycle time for the 1110 add-on memory is 750 nsecs, equal to the highest speed of Univac-supplied extended storage, Corporation III said.

Memory Prices

The memory costs $51,500 for a 32K block for the Univac 1106 II. a 64K block costs $79,500. The price is higher for other Univac mainframes.

The 32K memory for a Univac 1106 II leases at $1,550/mo on a three-year lease. The 64K size costs $2,250/mo. Lease prices on other mainframes are higher.

Corporation III is at 48 Darby Road, 19301.

•Mid-Range Disk

BLUE BELL, Pa. – Univac has doubled both the fixed- and removable-head disk storage available on its 90/60 and 90/70 CPUs by interfacing two drives from the top-of-the-line 1100 range.

The firm also plugged a hole in the 90/60, 90/70 tape drive lineup by adding the 97-kbyte Uniservo 14 drive to the 64-kbyte and 192-kbyte drives previously offered with those CPUs.

The 8433 removable-disk storage unit provides up to 200M byte/spindle compared with the 100M byte/spindle available on the 8430 drive.

The 8433 transfer rate is up to 806 kbyte/sec, the average latency is 8.33 msec, and the average arm positioning time is 30 msec.

Univac will continue to offer both the 8430 and the 58M-byte 8425 storage units, but said the 8433 will offer a better cost/performance ratio for larger users.

The 8405-00 fixed-head disk, previously offered on 1100 CPUs, provides an 8.34-msec average latency and a 622 kbyte/sec transfer rate. Equipped with 12 recording surfaces, the unit has a 6.2M-byte storage capacity, twice that of the 8405-04, which will remain available.

The 8405-00 will provide Univac virtual system users with a larger backing store capability, a spokesman noted.

Control Unit

The Univac 5039 control unit can handle an intermix of 8433, 8405-00 and the previously introduced 8430 and 8405-04 disk units.

The basic control will attach eight 8433 and/or 8430 units. To attach an additional eight units, an F2047 16-drive expansion feature must be added.

When 8405-00 drives are part of the intermix of 8433 and 8430 disk drives, an F2076 8405 capability feature is required to allow the attachment of a maximum of eight 8405 units.

A feature of the control unit is error correction code. As data is transferred from the channel to the disk storage via a write operation, the 5039 control unit computes seven bytes of error correction code and writes them on the track after each count, key and data field of the record.

The Uniservo 14 tape subsystem, previously available with Univac 90/30 CPUs, features automatic tape loading, dual-density and 7-track NRZI format capability. The unit employs the phase-encoded recording technique allowing the recording of data at 1,600 bit/in.

The tape subsystem has a 60 in./sec speed and a 96 kbyte/sec transfer rate with the phase-encoded format.

A dual-density version of the Uniservo 14 is available for recording either 9-track phase-encoded (1,600 bit/in.) or non-return-to-zero (800 bit/in.) data.

Uniservo 14 units are attached to the system via a 5045 control unit.

The Univac 8433 removable-disk system costs $36,480/spindle or $950/mo, including maintenance. The 8405-00 fixed-head system costs $76,800 purchase or $2,000/mo, including maintenance.

A minimum Uniservo 14 tape subsystem costs $36,048 or leases at $940/mo on a one-year contract with maintenance.

First customer deliveries of all three models are scheduled to begin in January.

Univac CPUs, 1403 Linked

WOODBURY, N.Y. – Users of the Univac 1106, 1108, 1110 and Series 90 CPUs can interface their machines to IBM 1403 series printers with a plug-compatible printer controller from Grumman Data Systems Corp.

Univac 490 series users can also interface their machines to the controller through a multiple subsystem adapter, a Grumman spokesman said.

The Grumman G1403/U-9000 printer controller comes in a stand-alone enclosure and includes logic cards, memories, mating connectors, power supplies and instructions.

It costs $17,000 or $500/mo including service on a minimum one-year lease from the firm at 45 Crossways Park Drive, 11797.

Bits & Pieces

CDC Joins Other Vendors In Designing 3340 Modules

MINNEAPOLIS – Control Data Corp. has joined Memorex, 3M and BASF in offering data modules for users of the IBM 3340 data module drive.

The CDC 889-35 and 892-70 modules contain disks, spindle, read/write heads and head arms in hard plastic canisters. The moving heads read or write data on disks that provide 35M or 70M bytes of storage respectively.

Purchase price for the 35M-byte module is $1,495. The 70M-byte module costs $1,995.

Modules also can be leased for one, two or three years at monthly charges that range from $47 to $54 for the CDC 889-35 and $67 to $75 for the 892-70.

IBM Accepts Intel Memory

SUNNYVALE, Calif. – IBM has formally accepted the Intel Memory System Division's method of attaching the In-7158 add-on memory to the IBM 370/158 CPU, according to Intel.

IBM acceptance means the mainframe manufacturer will provide maintenance on all CPUs to which the add-on is attached in accordance with approved designs.

The In-7158 memory unit is the first IBM-accepted system featuring a "swing-out" cabinet, which attaches to the CPU in place of one of the service doors, thus conserving space and providing easy access for maintenance, Intel said.

It is also the only IBM-accepted 370/158 memory add-on utilizing a 4K random-access memory (RAM), allowing users to expand memory incrementally up to 8M bytes, a capacity twice that available from IBM.

'Speechmaker' Makes System Speak

STAMFORD, Conn. – A voice message like "Foreman Check Anode Effect Pot Line Three" is typical of the audio response available when the Cognitronics Speechmaker device is used with a computer-controlled aluminum reduction process.

The Speechmaker, which synthesizes spoken messages from a stored vocabulary, can be interfaced to almost any minicomputer or full-sized computer, according to the firm.

Because the computer directs the Speechmaker to announce particular problems over a public address paging system, personnel can learn what's wrong almost immediately, Cognitronics said.

A Speechmaker system costs about $2,300 from Cognitronics at 25 Crescent St., 06905.

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Users Group Meeting Told

Teamwork Vital to Successful OCR Use

By Patrick Ward
Of the CW Staff

BOSTON – Optical character recognition (OCR) can succeed, but it needs even more teamwork than other DP applications, according to panelists at the OCR Users Association (OCRUA) summer conference held here last week.

The three-day show attracted 228 users. Eighteen vendors exhibited OCR scanners, wands and other equipment, supplies and services.

Reversing the usual DP motto, the maxim for OCR use is "garbage out, garbage in," said Gene T. Waters, who was one of several speakers making this point.

Waters is DP manager for The Gas Service Co. of Kansas City, Mo., which uses a Univac 2703 optical document reader to scan 80,000 turnaround documents daily.

The optical scanning operation costs $102,000/yearly, while keypunching the same volumes of data would require 40 operators and an annual budget over $1 million, he said.

Even though the firm has run its scanning applications successfully for over three years, Waters said the technique needs everyone's continuing attention in printing, marking and handling the turnaround documents.

"If we become careless about our work today, we know we must live with it in a couple of weeks when the documents return from customers," he said.

Bringing People, Paper Together

"OCR is 85% people" and "the success of OCR depends on successful interaction where people and paper come together," according to Richard H. Anderson, a systems manager with the Travelers Insurance Companies.

"A coordinated team approach to OCR systems with heavy user participation at every stage is the key to successful OCR," he advised.

This can be difficult to achieve, however, since DPers "often have a way of guarding their area to keep 'outsiders' out," he said. On the other hand, suspicion of DP people and the fear of getting out of their element may hold users back, he added.

In spite of the obstacles, Anderson said, "the benefits of finding a way to make user participation work are significant to everyone concerned."

Closer involvement would help users understand problems in computer printing of forms, operation of the OCR equipment, programming support and the logistical problems of supporting OCR within the DP operation, he pointed out.

DPers, in turn, could learn to "appreciate user problems in terms of accounting controls, human engineering and constraints in coping with error protection."

When working closely with the DP staff in the design stage of an application, the user is in a better position to provide specifications leading to a system that meets his needs. This also gives the systems staff a known goal at which to shoot, Anderson said.

Testing is easier on the DP people "because the involved user can directly communicate on problems that arise, rather than having systems analysts and programmers wallow in piles of rejected documents."

An involved user can also more easily understand training and procedural problems, Anderson said.

To get this kind of involvement, top management must first be willing to see "the big picture" and make sure that peaceful coexistence rules.

Second, management should form a project team with at least four permanent members. One or more users should be on the team, depending on its complexity.

There should also be a forms person or, lacking that, a systems and methods type; one or more systems analysts and programmers; and one or more DP operations people to represent the OCR operation and the printing of turnaround documents, if applicable.

Who should head the project team? Anderson said he would favor someone from the user area because the right user representative "can understand the problems of all involved areas and, perhaps more important, is best suited to 'sell' the OCR system to his area."

Part-time team members should include systems and technical types from the vendors and a reliable forms supplier who has had experience with OCR forms.

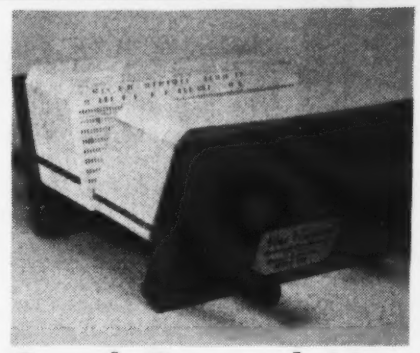
"I can't stress too strongly the importance of obtaining competent help from an OCR forms professional," Anderson said.

Other than the suitability of the forms for OCR, the user must consider their appearance, since they represent his firm to its customers. Other OCRUA speakers mentioned their dissatisfaction with the appearance of some OCR fonts.

A properly designed and tested OCR application will work properly – if it goes through rigorous enough testing, Anderson emphasized.

"Design, programming and testing cost big dollars, but a bad OCR operation will cost you even bigger dollars," he advised.

Finally, "continual monitoring in the production environment is absolutely essential," he said. Quality control in every area contributing to the application is an ongoing expense necessary to realize the dollar benefits available from OCR, he concluded.



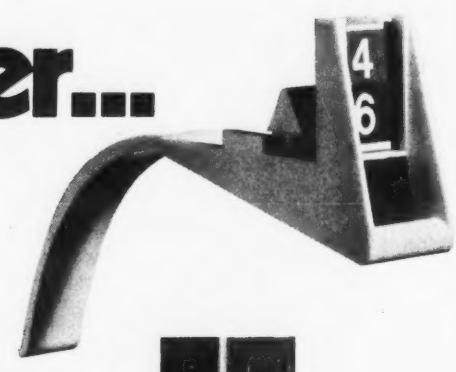
Card Round-Up

PIEDMONT, Calif. – The Hill Handler holds up to 1,000 punch cards at a time for sorting and contracts easily for smaller decks.

Angled face and back panels permit the computer programmer to flip to any card desired and keep it in full view until it is moved.

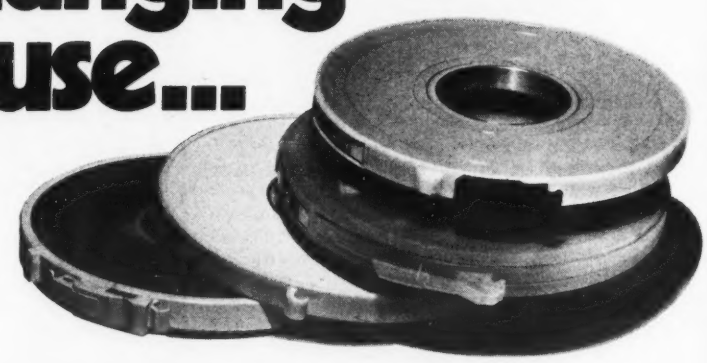
The handler costs $7.95 from Ronald E. Hill Co., 610 Moraga Ave., 94611.

With this hanger...



and this rack...

and any hanging tape you use...



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We call it Tab Hang II.™ That's because this compact, new concept in hanging tape storage accommodates any type seal or cartridge with a hook in use today—and, for that matter, probably any in store for the future!

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The world of EDP is caught up in a continuous revolution. It's only 24 years since the first business computer made its appearance, and we've gone from tubes, batch processing and single-site giants to multiprogramming, time sharing, data communications, giant minicomputers and hundreds of other technological innovations that were unheard of only recently. Keeping up with this revolution is difficult, to say the least. And that's why we've created the EDP Seminar Series.

The EDP Seminar Series gives you practical applications of the newest advances in computer management. What you learn will save you time and money, because each course is geared to practical dollars and sense application.

Remember, these are seminars, not lectures, and you'll be learning by doing in a shirtsleeve atmosphere. Workshops are an important feature of the Seminars, and round table discussions and shop talk luncheons complement the seminar presentations. The workbooks and course materials are yours to keep, so you'll always have a handy reference to all you've learned.

We've selected leading experts from around the country to guide each of our Seminars. They are highly accomplished specialists in their fields, experienced in presenting their techniques to industry and management. If you're involved in one of the areas shown, you should attend the EDP Seminar Series this fall. What you learn will benefit your company, your installation, and you.

Data Communications Course #1010 – Practical Data Communications Systems & Concepts

Dr. Dixon Doll, the nationally recognized teleprocessing consultant will lead this two-day seminar on the newest advances in data communications. The course covers areas like SDLC, HiD-LoD, DDS, newly approved major revisions to WATS, and the impact of Satellite Carriers.

Total Cost, including workbook, reference materials luncheons and continental breakfasts is $350. Additional registrants from the same company qualify for the reduced rate of $300.

San Diego	**Plaza Int'l Hotel**	**Sept. 29-30**
New York	**St. Moritz**	**Oct. 13-14**
San Francisco	**Dunfey's Royal Coach**	**Oct. 20-21**
Miami	**Hyatt Miami Beach**	**Nov. 17-18**

Data Communications Course #1020 – Advanced Teleprocessing Systems & Design

Also led by Dr. Dixon Doll, this course is a follow-up to course #1010. Special emphasis is given to techniques that minimize operating costs in commercial data communications networks. This three-day seminar covers procedures, approaches, and algorithms for evaluating and cost-optimizing network operations. Total cost, including an extensive set of customized course materials, is $450. Additional registrants from the same company qualify for a reduced rate of $400.

Miami	**Four Ambassadors (Sheraton)**	**Dec. 1-3**

Legal Tools for Computer Contracting and Protection

Under the instruction of Roy N. Freed, a nationally known lawyer, author and educator in the field of computer law, you'll learn how to increase your advantage in dealing with vendors that supply your installation. As well as practical discussion and review of your own contracts, subject areas covered in this 2½-day seminar include: Negotiations, Contracts, Warranties, Avoidance and resolution of disputes, Security, Fraud, Taxation, and Techniques for handling any transaction. Cost for the entire seminar, including continental breakfasts, luncheons and all course materials is $325. Additional registrants from the same company are charged only $275.

New York	**Summit Hotel**	**Oct. 22-24**
San Francisco	**Hyatt Regency San Francisco**	**Nov. 12-14**
Chicago	**Hyatt Regency O'Hare**	**Nov. 19-21**

How to Draft Effective Legal Agreements

This one-day seminar is a complete workshop for non-legal, technical people who may be called upon to draft legal agreements for their company. Also led by Roy Freed, this seminar covers a variety of formal agreements, their structure and the legal factors involved. You'll have all the basic skills necessary to write legal agreements, and you'll be able to spot items that really require the attention of lawyers.

Cost for the seminar, including luncheon and a complete workbook on the subject, is $135.

New York	**St. Moritz**	**Oct. 8**
Boston	**Sheraton**	**Oct. 15**

Data Base Design

Given in association with Leo J. Cohen and Performance Development Corporation, this three-day seminar is a package-independent examination of the techniques required for the design of effective data base systems. The seminar covers Effective Record Design, Physical Storage Techniques, Optimum File Organization/Indexing Techniques, File Integration, and much more.

Cost for the seminar, including course materials, continental breakfasts and luncheons is $350. Additional registrants from the same company qualify for a reduced rate of $300.

New York	**St. Moritz**	**Sept. 22-24**
Denver	**Denver Hilton**	**Dec. 1-3**

Performance Evaluation and Improvement

Saul Stimler, author of *Data Processing Systems: Their performance, evaluation, measurement, and improvement* will lead this two-day seminar on measurement techniques designed to save your installation money. As well as system performance at your own installation, topics covered include: Criteria for quantifying performance, pencil and paper analysis of a system, Benchmarking techniques, Realtime, Batch and interactive time sharing systems.

Cost for the seminar, including continental breakfasts and luncheons and all course materials is $250.

New York	**Summit Hotel**	**Sept. 29-30**
Wash., D.C.	**Marriott at Wash. Int'l. Airport**	**Oct. 20-21**
Chicago	**Hyatt Regency O'Hare**	**Oct. 27-28**
San Francisco	**Dunfey's Royal Coach**	**Jan. 19-20**

How to Increase Programming Productivity

John W. Brackett, PhD, Vice President of SofTech, Inc., will lead this two-day seminar for technical managers on the state of the art of Software Engineering. Under his direction you will learn how to: create more precise and visible analysis and design; reduce integration problems; improve software reliability; incorporate visible outputs into the software development cycle; increase programmer productivity; and improve programming management methods. Topics covered include: Structured programming; Top-down analysis, design, implementation; and Chief Programmer teams. Cost for the entire seminar, including continental breakfasts, luncheons, and all course materials is $300. Additional registrants from the same company are charged only $250.

New York	**St. Moritz**	**Oct. 6-7**
San Francisco	**Berkeley Marriott**	**Nov. 10-11**

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Book Delves Into On-Line, Interface Work

By Vic Farmer
Of the CW Staff

NEW YORK – It's rare when a solid discourse on the mechanics of a single aspect of computer processing comes along, but *Computer Interfacing and On-Line Operation* promises to be a required reference work for anyone working with minicomputers.

Author John C. Cluley, a senior lecturer in the Department of Electronic and Electrical Engineering at the Univeristy of Birmingham in England, has managed to delve deeply into the architecture and interfacing requirements of minicomputers in a language unobscured by complicated engineering hocuspocus.

Clueley does emphasize Digital Equipment Corp. and Data General equipment in his book – and that is appropriate, considering the sheer number of computers installed.

In the early chapters, the author quickly summarizes basic minicomputer architecture before he launches into data paths, multiplexing, register handling, parallel to serial conversion, analog to digital and digital to analog conversion and asynchronous operation.

After setting this groundwork, a more detailed examination of I/O arrangements considers on-line operations emphasizing interrupts and DMA transfers.

In talking of program interrupts, for example, the author cautions against the waste of keeping the CPU waiting in an unproductive loop when a device has a considerable period in the Busy state.

"A better way of organizing the program," he suggests, "would be to issue a start command to the device and continue computation until it notified the computer that it had finished and was ready again.

"This procedure avoids continually testing the device flag but requires some method of allowing an externally applied signal to interrupt the computer's normal sequential execution of programs," he added.

"A simple way of meeting the requirement is to arrange that the interrupt signal always causes a jump to a fixed store location. Since the computer must be able to return to its previous program as soon as the interrupting device has received attention, it is necessary to store the position reached in the current program before executing the jump."

And the author goes on and on to talk of interrupt vectoring, asynchronous transfers, data highway design, enabling and disabling interrupts and multilevel priority control.

After he finishes considering the problems of connecting devices to a computer through a relatively short link along an I/O bus, he advances to "the rather different situation" when the device is much further from the computer and discusses the different methods of data transmission needed.

Here he explains teleprinter interfaces, data error rates, synchronous modems, digital coding and a large portion of analog processing.

Cluley ends the book with a series of applications stories, advising that although the ideal arrangement would be a standard interface which fits the I/O bus of any make of computer, "the only practical arrangement at present is to have a standard interface at one remove from the computer bus.

"This means that all external devices have a standard highway or data bus to plug into with standard circuit conditions and signals.

"The highway then feeds into an adapter which is coupled to the computer I/O bus. Thus everything beyond the adapter is completely standardized, and if the computer is changed, the only hardware that needs changing is the adapter."

The 181-page book is priced at $14.50 from the publisher, Crane, Russak & Co., 347 Madison Ave., 10017.

Robot Roll Unit Provides Data For Warehousing

FLORENCE, S.C. – Finding a particular roll of fabric at La-Z-Boy used to be like looking for the proverbial needle in a haystack. But no more.

Now it's merely a matter of pushing a few buttons because La-Z-Boy dispensed with the traditional manual warehousing concept and replaced it with a mini system.

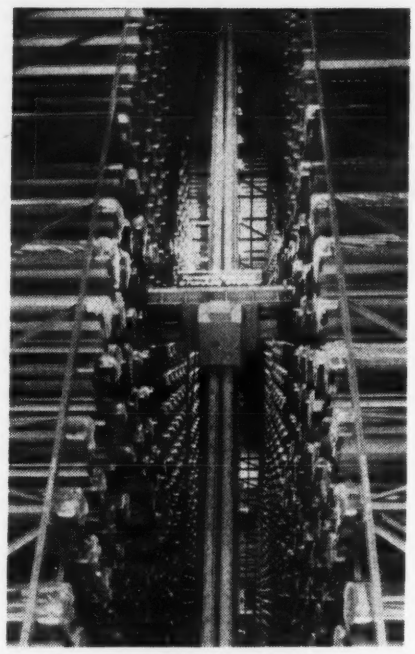
The fast-growing manufacturer of recliner chairs and other furniture previously maintained separate fabric inventories at seven plants spread across the country from South Carolina to California.

The random stacks of fabric rolls at each plant represented chronic control and handling problems. And with 5,000 chairs produced a day, each plant was forced to maintain its own large inventories of fabric to insure against delays in order processing and delivery. Inventory auditing was a major hassle.

"It was not uncommon to completely lose track of some fabric rolls," explained Philip Gibson, fabric processing center manager. The old system just didn't properly allow for accurate, up-to-date records."

So the firm replaced it. After two years of design and construction, La-Z-Boy has consolidated into one automated fabric processing center and all problems of lost inventory, incomplete records and shipping delays are now behind it.

The materials-handling system, built by Kenway, Inc. of Salt Lake City, Utah, consists of a 32K-word General Automation SPC-16/45 minicomputer, two 5M-byte Caelus disks, two Wangco 7-track 37-1/2 in./sec tape drives, a Centronics 100 line/min printer, a Documation 400 card/min reader, three Hazeltine 2000 CRT terminals and a Teletype Model 40.



Looking much like the tape cartridge pickers in IBM's 3850 automated tape system, this fabric roll selector system maintains inventory records.

This configuration also controls the automated picking and storage equipment.

Most of the daily activity of the center is directed from La-Z-Boy's home office in Monroe, Mich. From there, manufacturing plants' needs, inventory, ordering and distribution of fabric rolls are controlled by IBM 360 that communicates with the Florence processing center.

"Every day a pick list of fabric rolls to be shipped to each plant is relayed to us

(Continued on Page 22)

DP operator monitors daily communications with firm's mainframe at headquarters.

Just One More Step

Micros Overtaking Minis

By William R. Roach
Special to Computerworld

Minicomputers have had a major impact on enhancing data collection and calculation devices of all types – and microcomputers are pushing this trend even further.

Keypunch installations have been converted to key-to-disk systems, with several CRT terminals running off a minicomputer-based system which has extensive disk-handling capability. Today many of these key-to-disk systems, such as those supplied by Inforex, Computer Machinery and General Systems, are capable of being tied into large-scale host computers.

Microcomputers are now being used to substantially upgrade the capability of stand-alone data collection devices, giving them both formatting and error-correction capability, as well as converting them to low-cost terminals that can be tied into remote host computer systems.

Yes, these developments can enable the user to do more work in-house, but just think what it can mean for even the smallest service company, which normally has to spend 30% to 40% or more of all costs on the data entry and conversion function.

These new terminals and data collection devices allow that data entry function and many related costs to be relegated to the user. Later, data can be transmitted directly to service bureaus or collected and converted onto floppy disks or tape cassettes which can be mailed into the service center. A big advantage is that the data finally entering the host computer is cleaner and reruns are reduced.

Through microcomputers one can see the day – not too far off – when specific kinds of collection devices can be custom-designed for payroll, accounts receivable and other applications, or even specific customers.

Firms like MSI Data, which manufactures low-cost data entry systems, are already doing this. Moreover, in volume levels of 100 units, end-product-oriented semiconductor manufacturers like National Semiconductor can get very interested.

Sometime after 1980 we probably even will see the replacement of the pegboard system with low-cost, sophisticated data collection systems based on microcomputer technology.

Microcomputers and minicomputers also allow simple terminals, such as low-speed CRTs and keyboard devices, to be upgraded into user-programmable or intelligent terminals.

This is because the mini or micro allows logic and memory for data editing and some limited processing to be added. As a result, the intelligent terminal has flexible design for simplified user interface including custom keyboards, modularity to meet a variety of user requirements including control of other terminals and buffering capability to simplify the communications interface and the impact on host computer software.

In other words, more and more of the communications function can be done inside the terminal rather than at the host computer site.

Microprocessors are also being used in all functional areas of terminal design, including print mechanisms, carriage control, interface control and maintenance testing.

Potentially, the more intelligence that is placed in a remote device, the less that is required in the host computer.

Improving Communications

Improving data communications is another way that minis and micros have and will continue to impact users. Communication networks have been developed because of the availability of low-cost minicomputers which can be located in remote areas to manage communications.

In the future, microcomputers will be used to extend the capability of these multiplexer and concentrator devices and will place even more communication capability in the terminals themselves.

Additional functions that minicomputers and microcomputers allow to take place include storage and forwarding of data, switching to multipoints, providing backup circuits and systems, providing extensive error detection and control and correcting data before it is entered into the host computer.

In some cases, handling of both voice and data traffic and a capability to select from a variety of common carriers are also available.

One of the key results of this improved communications is that the host computer is relieved of extensive communications overhead processing. The develop-

(Continued on Page 23)

Robot Roll Unit Provides Data For Warehousing

(Continued from Page 21)

and recorded on magnetic tape," Gibson said. "The list denotes shipping priorities, stating which plant it should gather rolls for first.

"From there, the tape is loaded onto the SPC-16, which reads the tape and simultaneously directs the stackers to pick and deliver the fabric rolls."

The aisles, 55 feet high and 207 feet long, can hold a total of 20,520 rolls of fabric, each resting on a metal tray in individual rack locations. The computer guides the stacker cranes to vertical and horizontal coordinates by means of discrete binary-addressed code bars and optical sensors.

Upon retrieval of a fabric-loaded tray, the stacker glides to the front of the aisle and deposits the roll in a wheeled cart.

"At the same time. we are storing incoming fabric shipments," Dennis Merietta, assistant manager and engineer for the center, said. "The rolls are loaded on the carts and fabric cover numbers and yardage are entered into the mini on one of three CRT terminals.

"The operator then picks the aisle and the mini automatically arranges the rolls in a 'bin file' memory and puts them in their proper location, as well as printing out individual shipping labels," he explained.

In all, the system can store, retrieve and print labels for more than 2,000 rolls of fabric a day, in addition to printing out a list of rolls that are currently stored and a pick list of rolls retrieved and shipped, including their destination.

"We use the list in two ways," Merietta explained. "First, for our own crosschecking to discover any manual recording errors and, second, to send back to Monroe at the end of the shift, so the home office can form a new pick list for the next day."

The mini also maintains six other major files: 'bin map' showing, describing and locating each roll of fabric; an audit; a system parameter; an in-progress pick file; an in-progress store file; a destination description file; and an empties map file, showing unused trays.

Media III Lowers Price, Enhances Controller

ANAHEIM, Calif. – Media III said it has lowered its price and improved its Model 2601 cartridge-class, moving-head disk controller for the Data General computer family.

Options now available include Data General RDOS compatibility; Micos or MDOS compatibility; Diablo Series 20, 30, 40 or equivalent disk drive interface compatability; multicomputer access feature; up to four drives per controller; and an address convertor that permits one 10M-byte, fixed/cartridge disk drive to emulate four Diablo Model 31 disk drives operating under Data Genral RDOS.

Delivery is 30 days and the price is $2,600 from the firm at 2259 Via Burton, 92806.

Users Organize

HARRISON, N.J. – The first Basic Four User Group has been formed here.

The group, which had its first meeting earlier this year, is scheduling a full calendar of activities for its members during the 1975-76 season.

Any Basic Four User interested in obtaining information may contact Robert Mentus, c/o Charles F. Guyon, 1000 S. 4th St., 07029.

Interdata Minis Get Printer Controller

ORANGE, Calif. – A line printer controller which interfaces Centronics, Data Printer, Data Products, Odec and Printec printers to Interdata minicomputers is available from MDB Systems, Inc.

The controller is a single printed circuit half-board that fits into any 15-in. model Interdata chassis. The board comes with a ribbon cable with mating connectors furnished for connection to the line printer.

The interface is said to be software-compatible and transparent to the host computer.

MDB Systems said it will help users select the best line printer for their application and can furnish the controller alone or provide a complete printer package.

The interface is priced at $750. Lease arrangements are also available from MDB at 981 N. Main St., 92667.

Disk Memory Holds 38.4M Bits

SUNNYVALE, Calif. – The 8500 disk memory unit from Data Disc will provide up to 38.4M bits of data storage at average access times of 8.6- or 17.2 msec, according to the firm.

The rotating mechanism is contained within a sealed enclosure with an optional sustaining gas supply.

The unit is interface-compatible with the 8400 series disk units offered by the firm.

The unit is priced from $4,390 to $13,500 depending on quantity from the firm at 686 W. Maude Ave., 94086.

Star Trac Handles Police Tasks

ST. LOUIS – The Star Trac Systems from Joseph W. Larimore and Associates is an automated recordkeeping tool for small and medium-sized police departments.

Designed to eliminate paperwork in the communications and records area of a police department, the system includes a CRT terminal, disk storage, hard-copy printer and CPU.

Programs developed for police operation make the system function as an information collection tool, a storage and retrieval device and a dispatch control system.

Placed in the dispatch and records area of a police department, Star Trac can be used by dispatch and clerical personnel to control and update patrol activity and report information.

Depending upon information volume, the operating cost varies between $900/mo and $1,700/mo with either a reduction or maintenance of existing clerical personnel, the firm said from 848 Carillon Court, 63141.

Faster Printers Work With Daniel 4200

HOUSTON, Texas – Daniel Services, Inc.'s data controller/converter, the Daniel 4200, is said to permit conversion from conventional 15 char./sec typers to 30- to 120 char./sec typer/printers with any computer using tilt/rotate or other codes.

No software or hardware changes are required; the 4200 plugs in between the CPU and any device which uses standard asynchronous Ascii codes, the firm said.

One of the primary advantages, according to the manufacturer, is the elimination of costly reprogramming and hardware changes formerly required when a user wanted the speed, reliability and lower maintenance provided by printer/typer devices now available.

The 4200 costs less than $1,600 for the first channel, with each subsequent channel decreasing in price in the same system. Up to 10 printers may be handled by one 4200, which is housed in a standard 19 in. by 24 in. rack.

The 4200 consists of a circuit board for each output device desired and a dual power supply for each group of five boards.

The firm is at 9424 Emnora Lane, 77055.

Future May See Micros Moving Into Mini Areas

(Continued from Page 21)

ment of more sophisticated front-end processing equipment, such as that supplied by Comten and other independents as well as the computer manufacturers, also relies extensively on minicomputers and more recently on microcomputers to act as an integral part of the total data communications network.

The lower cost and functional similarities of microcomputers versus minicomputers is resulting in the replacement of some minis by micros. The first minis to be replaced will be those with lower capacity, such as those used in providing intelligence to terminals, controlling peripherals and in controlling other industrial applications, such as machine tools.

The microcomputers is really an outgrowth of the calculator circuits developed in the early 1970s to replace and extend the capabilities of the electromechanical and electronic desktop calculators that we all used then. Similar developments have occurred more recently with watches. It is this type of replacement we will see for the next few years.

Replacement of higher capacity minis, such as those that offer many thousands of words of storage and large 32-bit word length, will not be achieved for some years. However, we may see the use of microcomputer components within these large capacity minisystems to meet specific functional or application requirements.

Not Always Mini Replacement

There are also several application areas where microcomputers will open up new applications – areas in which replacement of minicomputers is not a factor. We have already begun to see this in several industrial products, consumer products and automotive systems.

The inherent advantages of low price, small size and weight, custom design potential and relatively higher internal speed of microcomputers will cause the new opportunities to be developed.

One of the major problems in the user acceptance of microcomputers to replace minicomputers has been the lack of available software and compilers. Now these are becoming available.

Another key advantage of microcomputers is the higher reliability inherent in the LSI manufacturing process. This reduces downtime and maintenance costs.

In the future, these advantages will also provide designers with the opportunity for design of new architectures in computer systems.

Roach is executive vice-president of Optimum Systems in Palo Alto, Calif.

MEET OUR YOUNG GIANT.

MAX III. HE KEEPS GROWING STRONGER.

We delivered our first MAX III operating system in 1971. It was the birth of a new state of the art in minicomputer software.

Since then, while other companies have been laboring to produce their first real-time multiprogramming software, ours has just been getting better.

Today's MAX III, in combination with our MODCOMP II hardware, is just about unbeatable for demanding real-time operations.

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Hundreds of MODCOMP II/MAX III systems have already proved themselves. Working in every conceivable kind of industrial and scientific measurement and control application.

Consider a few highlights.

In MAX III, 256 execution priority levels give you more flexibility than you're ever likely to need. For everything from highest priority foreground to deferrable background tasks.

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When it comes to programming, you can use the language best suited to the job. FORTRAN. Macro assembler. Or a mixture of both. With individual task protection to give you fullest security for all your programs.

Heavy software is only one side of the coin, however. Because none of it does a thing for you without the MODCOMP II hardware to make it all happen.

With up to 64K words of directly addressable memory, MODCOMP II gives you a lot more clout than most minicomputers that only let you address 32K 16-bit words at a time.

Four simultaneous access paths to memory allow non-cycle stealing I/O. Or may be used for multiprocessor configurations. With all four ports in operation, memory bandwidth is five megawords a second.

Fifteen general purpose registers and overlapped memory enable MODCOMP II to consistently outperform machines that offer only a handful of registers, with a cache memory that is supposed to solve all your problems. But often doesn't.

MODCOMP II/MAX III is fully upward compatible with all other MODCOMP computers including the 32-bit MODCOMP IV. So you can add on at any time as your needs grow. Even expand into a multiprocessor network system, without reprogramming.

But, like we said. These are merely highlights.

For detailed specs, and benchmark data that shows how MODCOMP II/MAX III stacks up against the best anyone else has to offer, write us.

After all, we're very proud of our young giant. He's already conquered a good part of the world. He's out to beat the rest.

Modular Computer Systems, 1650 West McNab Road, Ft. Lauderdale, FL 33309. Phone (305) 974-1380.

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SOLVING PROBLEMS WITH COMPUTERS.

Statos Prints 1,200 Line/Min

PALO ALTO, Calif. – A 22-in.-wide high-speed printer/plotter from Varian Data Machines is said to be capable of printing at speeds as high as 1,200 line/min or plotting at 2.75 in./sec. (paper speed).

The Statos 4122 interfaces directly to most popular minicomputers and can be used in an off-line configuration with larger systems, Varian said.

Hardware features of the 4122 include a 100 stylus/in. Bi-Scan writing head, a dynamic toning system, multiplexing capabilities for true simultaneous printing and plotting and a hardware character generator with 123 characters.

The electronic design incorporates a microprogrammed controller as a means for reducing the burden on the minicomputer and minimizing memory requirements.

The unit is priced at $12,900 with interfaces priced between $1,000 and $2,000.

The firm is at 611 Hansen Way, 94303.

Facit-Addo Combines Units Into Paper Tape Duplicator

SECAUCUS, N.J. – A low-cost paper tape duplicating system which affords the flexibility of a separate tape punch and separate tape reader is available from Facit-Addo, Inc.

The system makes use of the Facit 4070 table-top tape punch and the Facit 4020 table-top tape reader, joined by a special cable. The two machines can also be used for separate functions.

The 4020 reads up to 300 char./sec and uses a reading method utilizing light dispersion. The 4070 can punch 75 char./sec.

The firm is at 501 Winsor Drive, 07094.

Miniworld Products

Orion System Handles Records For Doctors, 100-Bed Hospitals

SUNNYVALE, Calif. – A new weapon against the high cost of medical and hospital care is a turnkey minicomputer system developed by Orion Systems.

The first installation is now operating at Consolidated Medical Corp. in Los Altos, recording and storing patient records in a real-time environment.

Designed for the medical field exclusively, the Orion system is programmed to handle records in multidoctor offices, hospitals of 100 beds or less, medical and radiological laboratories, clinics, hospital out-patient departments and convalescent homes.

Installations can have as many as 32 CRT terminals.

Records for an unlimited number of patients may be stored, with full information on a patient's name, age, address, attending and referring physicians, marital status, dates of visits and insurance coverage included, the firm said.

For each patient visit, the minicomputer can render a bill within one minute so more fees can be paid at the time of treatment, saving the expense of monthly billings and increasing daily cash flow.

It also issues monthly bills and insurance claim reports simultaneously with patient input and inquiry, thus cutting costs and enabling office personnel to go on to other tasks, Orion said.

A basic system priced at $34,400 has 10M bytes of disk storage, an Interdata 7/16 mini with 32K of memory, a Centronics 100 char./sec printer and a Conrac CRT terminal in addition to application and systems programming.

Orion Systems is at 950 Benicia Ave., 94086.

Qantex TDX Drives Feature Tape Buffer

PLAINVIEW, N.Y. – The Series TDX 1/2-in. tape drives from Qantex are said to provide 75 in./sec, 800- or 1,600 bit/in. and 7- or 9-track capabilities.

A patented tape-buffering scheme replaces both cumbersome and noisy vacuum columns and marginal tension arms, Qantex claimed.

A low inertia shutter, light-emitting sources and photocells result in reduced tape wear and improved tape tracking.

The shutter mechanism provides mechanical buffering for the tape by means of a servo mechanism that minimizes tape stretch and maintains tape tension, the firm said.

The speed of the tape, 75 in./sec, is maintained by the capstan motors and upper and lower capstans. The rewind speed is 300 in./sec.

Formatters and interfaces to most minicomputers are available from Qantex.

Rights to the TDX drive have recently been acquired by North Atlantic Industries from Infotec, Inc. who has been supplying the TDX drives to the industry for the last three years.

Prices start at $4,400 for a 75 in./sec, 800 NRZI, 7- or 9-track drive.

Qantex is at 200 Terminal Drive, 11803.

Fixed-Head Disk Memories Have Head-Lifting Devices

CHATSWORTH, Calif. – A series of fixed-head magnetic disk memories with parallel data channel operation offering data rates as high as 128MHz (32 channels parallel) with capacities up to 40M bits is available from Alpha Data, Inc.

The memories feature patented, fail-safe head-lifting mechanisms which eliminate disk/head contact during start and stop operations, the firm said.

Complete systems with controllers are available for the Data General, Digital Equipment Corp. PDP-11, Digital Computer Controls DCC-116 and Interdata computers.

Standard systems have 8.4 msec access time; optional "Ultra Fast" access time systems are also available, the firm said.

Prices are about $4,100 from the firm at 20750 Marilla St., 91311.

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The system is so flexible (read powerful), there isn't room to list all its uses. Here are a few examples of the **primary** uses of the GCS 2100 system:

A $35 billion bank in New York uses it for demand deposit accounting.

They have four GCS 2100 systems—two for random batch transmissions—payroll, billing, installment and commercial loans etc.—two for DDA. The latter systems handle over $5 billion worth of checks every night—checks the micro-encoding system cannot handle.

A $275 million bank in Seattle uses it for charge card transactions.

They estimate that first year cost savings since they installed their GCS 2100 system will be $50,000.

A $7 billion bank in Boston uses it for payroll.

They use their GCS 2100 system to process more than 40,000 payroll transactions a week for over 400 corporate customers. With a substantial savings over their former keypunch operation.

A $1 billion bank in Louisville uses it for trust account maintenance.

They use their GCS 2100 system to handle buys and sells, changes in principal, income and securities holdings. In addition to improved departmental control, increased security, throughput and quality of data, they reduced their trust data entry staff by 33%.

Whatever size **your** bank is, or whether you are using key punch or key-to-disc, the GCS 2100 system can offer these same kinds of efficiencies, economies and increased capabilities.

For more information on how the GCS 2100 system can help **your** bank, contact your local representative or Tom O'Brien, Director of Domestic Sales at General Computer Systems, Inc., 16600 Dooley Road, Addison, Texas 75001. Call (800) 527-2568/9 toll free or (214) 233-5800 within Texas.

See us at info75

GCS 2100
General Computer Systems Inc.

COMPUTER INDUSTRY

CI Notes

GSA Asks Second Extension Of Last Year's IBM Contract

WASHINGTON, D.C. – The General Services Administration (GSA) has asked IBM for a second 30-day extension of last year's contract to cover equipment installed at government user sites until a contract for fiscal 1976 is signed.

Theodore Puckorius, GSA's newly appointed commissioner of automated data and telecommunications service, said the agency is in final stages of negotiation and the contract will be signed very soon.

Meanwhile, GSA spokesman reconfirmed that the government purchasing agency has decided against awarding IBM a full Automated Data Processing (ADP) Supply contract because IBM failed to submit its proposed ADP supply contract before the Feb. 28 deadline [CW, June 18].

The contract GSA will sign with IBM will cover rental and maintenance on installed equipment, the GSA spokesman said.

The final issue to be resolved concerns IBM's government price on several older System/3s and 370s, which the firm reduced for commercial customers recently.

TRW Adds OCR to Line

LOS ANGELES – TRW Datacom International has assumed international marketing rights to the CES 7100 line of optical character recognition (OCR) equipment made by Computer Entry Systems Corp.

The unit will be incorporated into Datapoint equipment, which is also sold abroad by TRW, as well as sold separately on an OEM basis.

Singer Buys More REI Wands

DALLAS – The Singer Co. has increased its order for OCR wands from Recognition Equipment Inc. (REI) by $1.3 million.

Under the new order, wands for Singer's point-of-sale terminals are scheduled for delivery before the end of the year. The previous order called for 50,000 wands with deliveries expected to begin the first half of 1976.

Supershorts

Data Measurement Corp. has shipped its 500th DMC 400 series hard-copy terminal, which includes a Diablo Hytype I printer and microprocessor.

– – –

Tally Corp. has agreed in principle to obtain a license from Honeywell Information Systems Italia to partially manufacture and to market a 120 char./sec serial matrix printer.

'More Apparent Than Real'

Palevsky Says Xerox-SDS Fit Minimal

By Molly Upton
Of the CW Staff

NEW YORK – The combination of talents between Xerox Corp. and Scientific Data Systems (SDS) "was more apparent than real," Max Palevsky, founder of SDS, observed here recently.

Testifying in the U.S. vs. IBM antitrust case, Palevsky said, "I think at this time, if one were to ask me what actually did occur, I would say that relationship tended to be relatively minimal. At the time of the merger we thought it would be much more significant."

His testimony was given less than a month before Xerox announced it is leaving the computer business [CW, July 30].

Palevsky explained in his deposition, taken earlier, that the fit between the two companies looked like a natural one.

"The computer industry required vast amounts of capital and Xerox had access to vast amounts of capital; the customer base of Xerox and the customer base of the computer industry overlapped to a large extent, so that meant we had a kind of dual access to the same customers," he said.

"Thirdly, the technologies in some ways, the problem of handling documents and handling information and transmitting the information from the notion of information handling in its most general sense is one that appeared a natural for a company like Xerox to be in, and that meant computers and further down the line it would appear that there would be a technological – kind of symbiotic technological advantage.

"The technologies of handling documents and the use of digital technologies in handling information fit with Xerox's main business of reproducing and handling documents," he explained.

In outlining his reasons for founding SDS, Palevsky said he "felt the computer industry is a very unique kind of industry, and it was very difficult working under a management that really knew nothing about the industry itself, so that it made sense to be independent and, of course, there were opportunities to make a great deal of money."

He explained he was working at Packard-Bell prior to forming SDS in 1961, "and that company had come on hard times. The ideas I had about how to proceed in the computer industry required much stronger backing from the parent company, which [it] could not provide."

Palevsky founded SDS with about $1 million, of which he was responsible for $60,000 or $80,000, and 12 professional people and about five other staff members.

The firm initially manufactured machines in a 5,000-sq-ft area where it also headquartered its engineers and sales people.

At the time of the sale to Xerox, SDS employed between 4,000 and 5,000 people and Palevsky received $100 million for his share of the firm, he said.

Nature of Profitability

Some of Palevsky's statements shed light on the nature of profitability in the computer business and perhaps why Xerox had not found the grass as green as it had thought it would be.

Palevsky noted it was more expensive to enter the computer field in 1969 than in 1961 because "there were no longer pockets . . . where one could provide relatively unique equipment with a high profit margin on them.

"Consequently, profit margins for a company entering the field were relatively low, much lower than we experienced, and the investment required then to build the organization could not come out of gross profits, but had to come from some form of investment," he said.

Initially SDS based its prices on product costs and a profit margin. But around

(Continued on Page 26)

Users' Slow Migration to 370s Credited With FS Postponement

By Nancy French
Of the CW Staff

LONDON – An analysis of installed IBM 360 and 370 equipment has confirmed what observers guessed when IBM's Future Systems (FS) program was postponed – users were not migrating to the 370 as quickly as had been predicted, and introduction of a new series was premature from a profit standpoint.

According to *EDP Europa Report* (EDP/ER), the number of firms moving to the 370 by year-end 1974 did not even come close to estimates it published the previous April, and that trend has continued to the present time.

EDP/ER's April 1974 estimate of the following December's 360 and 370 population predicted the 370 population would grow to 9,569 installed units and the 360 population shrink to 7,770.

When actual December 1974 U.S. census figures were in, the number of 370s had grown to only 8,906 while the 360 population remained at a healthy 8,522.

Migration to the 370 in Western Europe was even slower, the figures showed. At year-end 1974, 70%, or 9,062, IBM mainframes being used there were 360s and only 30%, or 3,811, 370s had been installed, EDP/ER said.

Two Parallel Beliefs

EDP/ER's analysis of population figures, the report said, supported two parallel beliefs:

- The pace of acceptance of technological innovation had slowed, thus extending the life cycle of computers beyond the previous norm.
- The unstable economic conditions in most industrialized countries persuaded users to hold on to their equipment.

The 1974 installed base of large IBM systems by percent showed greater acceptance of the 370 by U.S. users.

In the U.S., 48.9% of IBM equipment in use was 360s.

In contrast, the 360 population outside the U.S. was 66.2% with 370s representing only 33.8% of IBM installations.

Total worldwide figures showed 56.7% of the IBM population was still 360s, with 43.3% 370s.

Although the overall pattern of European installations showed a relatively slow acceptance of the 370 series, the pattern varied widely on a country-by-country basis, with British adoption of the 370 system far ahead.

IBM 360 systems in the UK year-end 1974 numbered 931, or 57%, of the total installed base of its large IBM systems. Installed 370s numbered 704, or 43%.

In Western Europe, by comparison, 360 systems in use still numbered 9,062, or 70%, of IBM's installed base.

EDP/ER offered two explanations:

- The 370 series, with two models manufactured at the Havant, England, plant, was more closely associated with local industry than the 360 series. Clearly "an emotional rather than a logical point," this, nevertheless, served "to enhance prospects in the UK."
- Europe is a small systems market while the UK has been a medium systems market, affecting the balance in two ways – first, "because the propensity to upgrade among small systems users is apparently less than that amongst medium scale users; and secondly, because 370 prospects in the small systems area have been eroded by the System/3."

Since most of IBM's past success has rested on its ability to upgrade existing customer bases, the 370 has a "long way to go before covering its original target – the 360 base," the report noted.

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HIS Software Policy Called 'Company's Death Rattle'

By Nancy French
Of the CW Staff

BOSTON – Honeywell Information Systems' (HIS) new software licensing policy – coupled with the company's refusal to precertify equipment under HIS maintenance as still maintainable after resale – "are the sound of the company's death rattle – the beginning of an orderly liquidation of the company," A. (Sonny) Monosson said here last week.

Monosson is president of American Used Computer Corp. and chairman of the Computer Dealers Association.

Monosson, who said he spent 13 years financing companies and watching many of them struggle before going out of business, said "you begin to learn the pattern.

"The first thing you do if you're going to liquidate a company as big as HIS is dispose of all off-rent equipment, and you can't move that equipment if you have end users and used equipment dealers out there selling equipment and competing with you."

Reliable sources within HIS estimate the firm is warehousing approximately 1,000 used systems, including such equipment as the 1200, 1250, 2200, 3200, 105, 110, 115, 120, 125, 200, as well as the 2020, 2030 and 2050.

"You wouldn't do this if you were busy producing new items or if you wanted to keep customers happy so you could sell them a new, bigger system next year," Monosson said.

One user who had decided to buy an HIS system from American Used Computer was told by an HIS salesman he could use the operating system American Used was offering with the system only after paying HIS an initial licensing fee of $17,000 and an additional software maintenance charge of $585/mo to $1,000/mo.

HIS offers operating systems and all other necessary programming routines free of charge of users who buy used equipment directly from HIS.

From 1964 to 1970, the H200 through 2000 series systems were sold with no restrictions on software; not until 1970 did an HIS contract even mention the word "software," Monosson explained.

Many of the systems now on the used market predate software transferrability restrictions. "That software is in the public domain, this is clearly illegal," Monosson declared.

By comparison, "there's never been a problem with IBM software, bundled or unbundled. Any software initially purchased from IBM goes with the machine," he said.

Nor have users ever had this problem with other vendors such as Burroughs or Univac, he noted. While both deal in their own used equipment and are "tough competitors," they are always cooperative when it comes to providing software and reasonable maintenance service for resold equipment, Monosson said.

When an IBM system that has been under IBM maintenance, for example, IBM certifies that it will be responsible for installing all changes in machine, including the latest release at the time maintenance is discontinued and the system goes into the warehouse.

When that system is moved to a new installation, IBM's customer engineers make those changes free of charge, exclusive of warehouse deterioration or damage in shipment, he pointed out.

The customer is charged for updating the system to reflect releases issued during the period that the system was out of service, Monosson explained.

Union of Xerox, SDS Poor Fit: Palevsky

(Continued from Page 25)

1965, it "started to compete in much more direct fashion with IBM and our prices therefore had to take into account IBM pricing," he said.

Generally SDS sold at about 10% to 20% below IBM price on a cost/operation basis, he said.

SDS moved into the broader market area, he explained, because "as the company grew, the market we were in became too confined and, secondly, the distinctions between business and scientific processing became blurred."

When SDS began to come out with machines designed to perform general data processing as well as scientific functions, thus competing more directly in the arena with IBM, it needed to offer its machines on a lease basis because of "pressures of the marketplace."

This created problems of capital requirements and profitability.

"A company like SDS in a sense chases its own tail. In order to lease, one needs large sums of money. In order to raise those sums of money, one has to be profitable, because that's what the financial community looks at.

"However, leasing in the conventional IBM sense, that is, a one-year lease with no commitment by the customer beyond a single-year lease, means that the revenue one receives from placing the computer is significantly less than one would receive if one sold that computer," he said.

"That, in turn, affects profits, and that, in turn, limits one's ability to raise the money needed for leasing. So the problem is circular."

Reasons for Selling

SDS sold out to Xerox for a number of reasons, including the capabilities that Xerox capital could provide, he said.

"I think the reason is very complex. We knew that in order to continue to maintain our share of the market and, hopefully, to increase it, we needed very large sums of money.

"We knew that because of changes in the technology we would have to become more vertically integrated" and "have to provide, in order to stay competitive, a broader range of equipment . . . The price that Xerox offered for the company was very attractive."

Before the merger, Palevsky had estimated his firm would need "several hundred million," somewhere in the neighborhood of $240 million, for a five-year plan.

Palevsky terminated his association with Xerox in 1972, when by mutual agreement he did not stand for reelection on the board of directors.

"After SDS was acquired by Xerox, the company started to do quite badly, which created a certain amount of strain between myself and some of the other executives at Xerox," he said.

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RCA

Versatec Sales Allow Price Cuts

By Nancy French
Of the CW Staff

SANTA CLARA, Calif. – While many companies are laying off production employees as a result of a drop in orders, Versatec said a 50% increase in its business this year has reduced production costs enough to allow a cut in prices.

The price cuts range from 5% to 15% and cover all product lines.

The new price on the company's biggest seller, the high-resolution, dual-array, 200 dot/in. D1200A printer/plotter is $8,400 compared with the previous price of $9,700.

To date, more than 3,000 units have been sold and installed throughout the U.S., western Europe and Japan, according to Milton Reed, the company's vice-president of marketing who added. April was the best month in the company's history.

Print quality has improved markedly from the widely spaced 72.5 dot/in. resolution introduced on the company's first machine in 1970, Reed said.

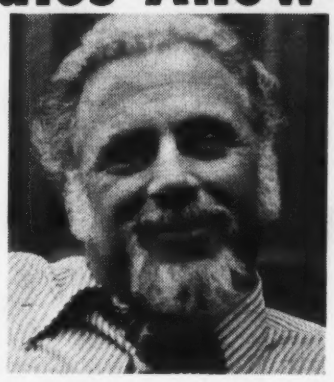
The 200 dot/in. resolution allows the user to print fine quality Japanese, Chinese and Arabian characters as well as generate top-quality, camera-ready art for the publishing industry, he added.

The printer/plotter combination allows production of text as well as fine quality engineering drawings, music, graphics and other artwork, Reed said.

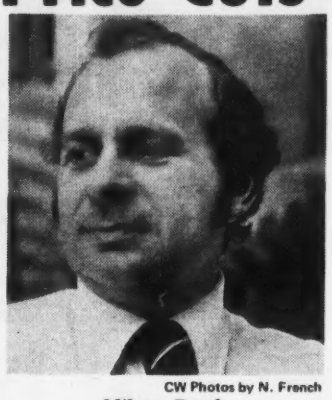
"And the machine that prints the overlapping dot matrix that makes possible the 200 dot/in. resolution sells for less than the original equipment introduced five years ago," Reed remarked.

Sales Forecast

Better resolution and higher speeds will earn the company more than $10 million in sales this year, according to Renn Zaphiropoulos, president, chairman of the board and one of the company's founders.



Renn Zaphiropoulos



Milton Reed

CW Photos by N. French

"Besides Versatec, there are really only two other companies in this business – Varian and Gould," Zaphiropoulos explained.

"Our 3,000-unit installed base gives us about 50% or 60% of the market, and the balance is split between the other two."

The company sells about 30% to 35% of its products through OEMs in the phototypesetting business. The balance is handled through manufacturer representatives, and the company has no plans to change, he said.

Versatec is moving into another market area now, based on its wider units – the geophysical market, Zaphiropoulos explained.

The 4400 series should be extremely effective for engineering drawing, weather mapping and civil engineering applications such as designing highways," he explained.

Versatec also aniticpates a subcontract for some ruggedized models for the military this year to add to its increasing business.

The company is still privately held by its original five founders, the Bank of America and a couple of venture capital firms, Zaphiropoulos said.

As the company grows, the original five are learning it takes different talents to run a company than it did to start one.

Things change basically in matters of volume, he explained. Monetary risk is greater. Instead of one problem, there are 10. "When you first get started, you may have to do your own quality control, and, when you become too busy, you have to hire someone else to do it."

The biggest problem is the threat of change, he explained. "People try to solve a $10 million problem with a $1 million solution."

Managing a company like Versatec today during its $10 to $20 million growth period is very exciting," he said, and quite different from the original start-up.

The constant change is stimulating, Zaphiropoulos said.

"Thirty years ago, all hard-copy output was generated by the brain. Today, we take the drudgery out of writing and drawing, leaving only the creative aspects to man," he said.

Profitable since 1973, with sales of $3,200,000, Versatec increased revenues another $3 million the following year and in April 1975 announced sales in excess of $9,500,000.

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Contracts

Honeywell, Inc.'s Traffic Control Operations has received an $868,000 contract from the City of Kettering, Ohio, for a computer-operated system to control traffic at all intersections now equipped with traffic signals.

Zentec Corp. has received a contract from Deltaconsult for 150 Zentec 9000 series programmable terminals to be used in Deltaconsult's graphic arts minicomputer system.

Kennedy Co. has received an addition to its contract with Univac to include Model 9100 vacuum-column tape drives. The contract extends for 18 months with options for renewal.

Cyphernetics Corp. has received a five-year contract from Michigan Bell Telephone designating Cyphernetics as the primary vendor of remote computing services to Michigan Bell. Cyphernetics will provide a dedicated, large-scale computer system.

Incoterm Corp. has received a $3.5 million contract from International Computers Ltd. for the supply of SPD 10/25 display equipment.

ADL Systems, Inc. has received a contract to develop, design, program and assist in implementing a computerized order entry system for Ocean Spray Cranberries, Inc.

ADL Systems, Inc. has been awarded a $600,000 contract by the City of Boston, Mass., to design and develop a computerized dispatching and reporting system for the Boston Police Department.

Peripheral Dynamics, Inc. has received a multiyear OEM contract from Incoterm Corp. to supply card-reading equipment.

Ampex Corp. has received from Modular Computer Systems a contract in excess of $2 million to supply a variety of disk drives, including the DM 313 and the DM 323.

Honeywell has been awarded a $388,000 contract by the California Department of General Services for production of microprocessor-based traffic signal controllers to be used on freeway access ramps.

Computer Sciences Corp. has been awarded a facilities management contract by the commissioners of Pierce County, Wash.

Charges Breach of Contract

CIG Sues Intel for $9.3 Million

NEW YORK – Computer Investors Group, Inc. (CIG) has filed a breach of contract suit against Intel Corp., which supplied add-on memories to CIG.

The suit requests $9.3 million, including $2.5 million in punitive damages.

The move follows, but is not in response to, a suit filed by Intel against CIG, now in the U.S. District Court, Northern District of California, a CIG spokesman said.

In that suit Intel is seeking $1.4 million for products sold and delivered to CIG. Intel would not comment on the CIG countersuit.

The CIG suit charges Intel breached its contracts in several ways and seeks to enjoin the firm from removing its equipment from CIG customer sites.

Says Equipment Defective

CIG claims Intel's equipment was defective in material and workmanship and did not perform to specifications, thus causing CIG to lose rental payments. In addition, delivery in several instances was not timely, causing lost rental, CIG alleged.

CIG is claiming expenses for extraordinary maintenance problems as well as lost revenues in the amount of $314,000 because it was unable to give satisfactory customer references of Intel memories.

Intel's entry into the direct markting of its products, as opposed to OEMing them, was also a grievance cited by CIG, which called it a willful and material breach of the agreement because Intel attempted to sell and or lease its products to CIG customers, thus replacing the CIG-installed units.

"Unless Intel is immediately enjoined from this conduct, plaintiff CIG will suffer irreparable harm," according to the suit.

Had CIG known of Intel's intention to market directly, it would not have made its 1974 agreement with Intel, the suit said in charging Intel with fraud on this count.

CIG further claimed Intel had confidential knowledge of future CIG customer prospects and, beginning in the first quarter of 1975, "wrongfully utilized information so disclosed to solicit such prospective customers for its own benefit."

CIG asked the agreement between the two firms be terminated with no further obligation by CIG to Intel.

CMC Sells Subsidiary In West Germany

MARINA DEL REY, Calif. – Computer Machinery Corp. (CMC) has sold its German subsidiary, and plans are proceeding for the sale of its French subsidiary, the firm said.

Sale of the unit will bring in $1 million in cash and a commitment to purchase $6 million in equipment from CMC over the next five years.

In addition, CMC will receive prepayment of about $500,000 in license fees due from Computer Machinery Co. Ltd., formerly also a wholly owned CMC subsidiary.

The German operation was bought by a group of CMC Ltd. executives and the group that acquired CMC Ltd., Telsys Corp. Holding N.V. and Multifinance N.V.

Modcomp Completes Buy Of German Subsidiary

FORT LAUDERDALE, Fla. – Modular Computer Systems, Inc. (Modcomp) has acquired the West German firm that accounted for 50% of its international business in 1974.

"We now have direct sales operations in each of the major European markets, enabling us to compete more effectively in those markets," Kenneth G. Harple, the company's president, said.

Modcomp increased its previous 15% share of the German firm Gesellschaft fur Modulare Computer Systems GmbH & Co. KG, headquartered in Ettlingen.

Dr. Einar Kapfer, founder, will remain as president of the wholly owned subsidiary.

Fisher New Prime President

FRAMINGHAM, Mass. – Kenneth G. Fisher has joined Prime Computer Inc. as president, chief executive officer and director. He was previously vice-president of central operations for Honeywell Information Systems and was involved in marketing operations at General Electric.

B.F. Robelen, vice-president of finance, treasurer and secretary, has been serving as acting president.

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Probst Gets Corporate Post

Sperry 'Playing It Cool' on Xerox

By Molly Upton
Of the CW Staff

NEW YORK – Sperry Rand Corp. has not been approached by Xerox Corp. about taking over its computer base, nor has Univac made any inquiries.

"We're playing it cool," Sperry Rand Chairman J. Paul Lyet said at a press briefing preceding the annual meeting last week.

"We'll be interested to look at it. We'll look at anything," he added.

Univac's computer business has been stronger than ever, with record bookings for any quarter in the first quarter, he noted.

Univac is number two in the industry and, on the basis of new orders in the past year, the fastest growing percentage-wise, Lyet commented.

The firm's computer backlog is over $1 billion for the first time. About 600 Model 90/30s have been booked and about 100 have been shipped, Lyet said.

The Univac 1100 series accounts for over 40% of the backlog, he added.

Lyet lamented that Xerox's decision to leave the business raises doubts about the viability of other, non-IBM firms.

One of the reasons Univac bought the RCA base, he explained, was to prove it was in the business to stay. Univac lost an order when RCA went out of the computer business because the customer decided it was safer to go with IBM, he recalled.

As if to reaffirm even further Sperry Rand's commitment to the DP area, Lyet announced Gerald G. Probst has been appointed to the new post of executive vice-president, in addition to his duties as president of the Univac Division.

Observers say the move indicates Probst has the inside track for the position of chairman. K.F. Thompson, president of New Holland Farm Division was named a vice-president, as was Richard R. Brown, treasurer.

Foreign Interest

Sperry Rand is interested in becoming a minority partner with a European DP firm and has talked with Siemens and Philips, Lyet said.

One problem is they "can't believe we'll accept a minority position. We want to be a partner – we don't want to be hogs," he said.

As an example, he cited the partnership with Saab-Scania "In the long term, we're better positioned to be in the market as a minority partner," Lyet said.

One reason for Sperry's desire for a partnership is to combat increasing nationalism when selling to European governments and nationalized institutions. "It's tough to compete," he said.

There is a new 900 series unit in engineering, which will be at the upper end of the line, he told reporters.

Future Plans

Asked at the end of a two-hour-plus shareholders' meeting about Univac's future computer plans, Lyet said the firm already makes minicomputers – the UYKs sold to the military – and has spent "a tremendous amount of work developing small computers."

But, he noted, the company isn't going to introduce a machine unless it feels it can carve a market niche with it and make money with it.

On a corporate level, Lyet said he expects this year to be better than last, "but not much."

The projected increase is going to be difficult to attain, he said. Noting the firm achieved its 13th straight quarterly improvement, he said, "It's like a man chinning himself – each time you get up there it gets tougher."

Things are about on plan, he said, and the firm has been "cutting the cloth to fit the pattern."

Sperry has reduced its employment from about 98,000 a year ago to 91,000, involving some plant closings and layoffs.

Asks Disc Support

Lyet enumerated a number of external environmental problems that he sees affecting Sperry Rand and other corporations and made a strong plea for shareholder help in persuading Congress to continue the domestic international sales corporation (Disc) benefits.

The elimination of Discs [CW, July 23] would double the tax on foreign source income by eliminating the foreign tax credit and ending the tax deferral concept, he explained. Without Disc, last year's earnings would have been reduced by $23 million.

Among the problems are a "lack of understanding among those in government and in other parts of our society about the interrelationship and interdependence between inflation and the free market system; economic freedom and personal freedom; and foreign investment and jobs in this country," he said.

There is also lack of understanding about the interrelationship and interdependence between productivity and capital investment; capital investment and capital formation; capital formation and the security markets; and, ultimately, business profits and government revenues, he said.

Other problems are the general worldwide economic environments, attacks against multinational companies, rising economic nationalism and the difficulties in obtaining capital needed in the future to finance growth opportunities.

The meeting was notable for Lyet's humor and patience in dealing with not only Wilma Soss but Evelyn Y. David, inveterate shareholders who attend most large corporations' annual meetings.

At times Lyet had to act as arbitrator between the two, and sometimes between the two women, who nearly monopolized the microphones, and the rest of the shareholders, who were becoming impatient.

"Now, girls," he said more than once, ensuring order in the room.

Earnings Up 9.9%, Revenues 8.7% In Sperry Rand's First Quarter

NEW YORK – Sperry Rand Corp.'s earnings for the first quarter rose 9.9% while revenues rose 8.7% over those of the same year-ago period.

Computer bookings were well ahead of the same quarter last year and have been running at a particularly strong pace for the past six months, the firm said.

"Customers are responding very favorably to our new product programs – particularly the new 90/30 medium-scale computer and additions to the large-scale 1100 series.

"This has buoyed Sperry Univac's bookings performance despite the erratic industrywide demand for computers around the world," J. Paul Lyet, Sperry chairman said.

Overall, however, Lyet said the company is experiencing "a mixed business pattern with total revenue, income and new order figures moving ahead, while individual product and geographic trends vary from strong to predictably weak."

Earnings rose to $29.2 million or 84 cents a share compared with $26.5 million or 77 cents a share in the same period last year.

Revenues totaled $771.2 million compared with $709.7 million in the year-ago quarter.

On a 12-month running basis, revenues for the period ended June 30 rose 14% to $3.10 billion compared with $2.72 billion for the prior 12 months.

Earnings were $134 million, including $5.4 million in gains from the sale of land, compared with $118.6 million in the same period last year, which has been restated to reflect a change in accounting for certain computer engineering costs.

Sperry's total order backlog was $1.8 billion as of June 30, about the same as a year ago, Lyet said.

He expects the present business pattern to continue in the near future, he said, adding "price constraints combined with excessive wage increases in several European countries are putting pressure on profit margins and we see little relief in sight.

Farm equipment orders and revenues were improved over the year-ago quarter.

AUSTRALIA

Authentic information is freely available **WITHOUT CHARGE** from the Australian Embassy in Washington, D.C. (202) 797-3000, and the Australian Consulate General in New York (212) 245-4000, San Francisco (415) 362-6160, Los Angeles (213) 380-4610 and Chicago (312) 329-1740.

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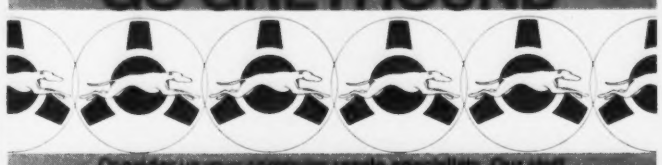

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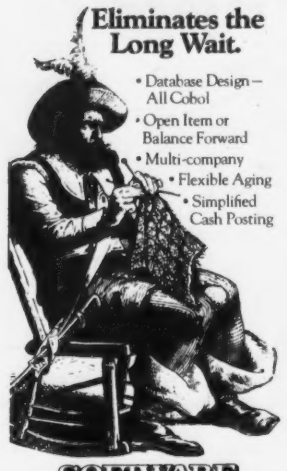

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SANTA CLARA, Calif. – Aided by $4.9 million in special credits, Memorex Corp. attained second-quarter earnings of $6.2 million or $1.32 a share compared with a loss of $5.3 million or $1.24 a share in the same 1974 period.

About $4 million of the 1974 second-quarter loss was attributable to a write-down of assets.

The special credits for this year stemmed from a $2 million gain on purchase of nearly $7 million of the company's 5-1/4% convertible subordinated debentures and $2.9 million of tax benefits, including $1.9 million related to the debenture purchase.

Revenues for the second quarter totaled $65.6 million, a 24% increase over the $53.1 million in the year-ago period.

Half-Year Revenues

For the half year, revenues rose 25% to $127.2 million compared with $101.9 million. Sale of equipment and the conversion of leased equipment to sale contributed significantly to revenue growth and to the improved profit and cash performance, the firm said.

Earnings for the six months rose to $7.8 million or $1.62 a share, including extraordinary credits of $5.5 million, compared with a loss of nearly $7 million or $1.61 a share in the same period last year.

Losses from foreign exchange adjustments were $1.5 million for the first half of 1975 compared with $1.8 million in the year-ago period.

During the quarter, the firm's cash and short-term investment position improved $4.6 million to $20.5 million, despite payments of $2.5 million for the acquisition of debentures and $10.1 million in cash repayments of senior debt.

Shareholders' deficiency was reduced to $13.2 million from the December 1974 figure of $23.7 million, the company said.

Sycor Results Up

ANN ARBOR, Mich. – Revenues and earnings were up in both the second quarter and six months for intelligent terminal maker Sycor, Inc.

Revenues rose 34% during the quarter to $13.1 million compared with $9.8 million in the year-ago quarter.

Earnings, including a $284,500 tax credit, totaled $1.4 million or 48 cents a share compared with $1.3 million or 48 cents a share including a $530,000 tax credit.

During the six months, revenues rose 27% to $24.3 million from the $19.1 million in the same period last year.

Half-year earnings totaled $2.6 million or 92 cents a share, including a $666,500 tax credit, compared with $2.2 million or 79 cents a share when there was an $865,000 tax credit.

CMC Half-Year Earnings Shrink Despite Record Quarter Revenues

MARINA DEL REY, Calif. – Despite record second-quarter revenues, Computer Machinery Corp.'s (CMC) earnings shrank drastically, and the firm showed a loss of $802,000 for the six months.

Although at the end of May company officials had projected a loss of about $3 million for 1975, Richard V. Plat, vice-president of finance and treasurer, said the increased sales to third-party lessors and the sale of both European subsidiaries should approximately offset the anticipated loss.

Results of the sale of the German subsidiary will show as an $800,000 profit in the third quarter, and negotiations are proceeding for the sale of the French subsidiary.

The firm sold $2.8 million in leased equipment to third-party financial institutions, slightly more than planned earlier, with third-party sales for the six months totaling $3.5 million compared with $4.2 million in the year-ago period.

For the quarter, revenues hit a record level of $16.2 million compared with $15.2 million in the same 1974 period.

But earnings shrank to $292,000 or 6 cents a share compared with $836,000 or 16 cents a share in the year-ago period.

During the half, revenues rose to $30.1 million compared with $29.2 million in the same period last year, but CMC lost $802,000 or 15 cents a share compared with earnings of $1.8 million or 34 cents a share. During the 1975 period, there was a special credit of $140,000 compared with $476,000 in the year-ago period.

"Although the domestic net order rate is not yet equal to the 1974 rate, significant improvements were realized during the second quarter, and, as the recession wanes, the net order rate should continue to improve," said Plat.

Anderson Jacobson Has Record Year

SUNNYVALE, Calif. – Anderson Jacobson, Inc. scored its fourth consecutive record year, with earnings rising 40% and revenues up 55% over those during 1974.

Incoming orders slackened during the last part of the year ended March 31 and the beginning of the new fiscal year, and some lease terminations occurred, the company said.

"The effects of the recession have been manageable by the company so far, but could have a worsening impact if the recession should continue well into the new fiscal year," President Raymond E. Jacobson said.

In addition to recession, increased competition was a factor in the drop in orders, Jacobson said.

For the year, the firm earned $663,906 or 27 cents a share compared with $475,095 or 19 cents a share in 1974.

Revenues rose to $13.4 million compared with $8.6 million last year. Lease and service revenues reached nearly $11 million compared with $7 million last year. Sales climbed to $2.4 million compared with $1.7 million last year.

Expenses Written Off

Anderson Jacobson said it wrote off all deferred expenses on its books as intangible assets at the end of the year, including $352,343 in product development costs and $494,224 in initial lease placement expenses.

Despite the writeoff, the firm's total assets increased 24% to $21.7 million from $17.5 million last year, the firm said.

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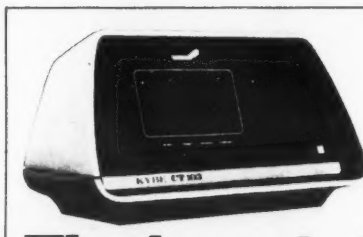

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Earnings Reports

MEASUREX
Three Months Ended May 31

	1975	a1974
Shr Ernd	$.29	$.39
Revenue	13,690,000	9,413,000
Earnings	943,000	1,200,000
6 Mo Shr	.72	.68
Revenue	27,046,000	18,231,000
Earnings	2,330,000	1,979,000

a-Restated to include unrealized foreign currency gains of $180,000 in the quarter and $201,000 in the half; also includes accounting change.

MOHAWK DATA SCIENCES
Year Ended April 30

	1975	1974
Revenue	$170,109,000	$167,781,000
Disc Op	(688,000)	(626,000)
Spec Chg	a(4,285,000)	.....
Loss	25,962,000	14,884,000
3 Mo Rev	44,512,000	42,236,000
Disc Op	.....	(277,000)
Loss	11,457,000	10,638,000

a-Cumulative effect of accounting change.

RAPIDATA
Three Months Ended June 30

	1975	1974
Shr Ernd	$.14	$.05
Revenue	3,660,420	2,763,866
Earnings	261,089	91,342
6 Mo Shr	.33	.09
Revenue	7,257,746	5,450,863
Earnings	610,925	171,907

DECISION DATA COMPUTER
Three Months Ended May 31

	1975	1974
Shr Ernd	$.02	$.07
Revenue	11,157,000	9,932,000
Tax Cred	99,000	128,000
Earnings	68,000	270,000
6 Mo Shr	.13	.11
Revenue	22,847,000	17,166,000
Tax Cred	261,000	194,000
Earnings	493,000	411,000

NATIONAL DATA
Year Ended May 31

	1975	1974
Shr Ernd	$.36	$.26
Revenue	32,381,417	31,745,248
Earnings	1,889,652	1,364,238
3 Mo Shr	.08	.06
Revenue	8,274,794	7,860,753
Earnings	392,753	308,979

CAMBRIDGE MEMORIES
Three Months Ended May 31

	1975	1974
Shr Ernd	$.06	$.19
Revenue	5,777,000	6,056,000
Earnings	103,000	321,000
9 Mo Shr	.15	.52
Revenue	16,680,000	16,552,000
Earnings	251,000	748,000

HITACHI
Year Ended March 31

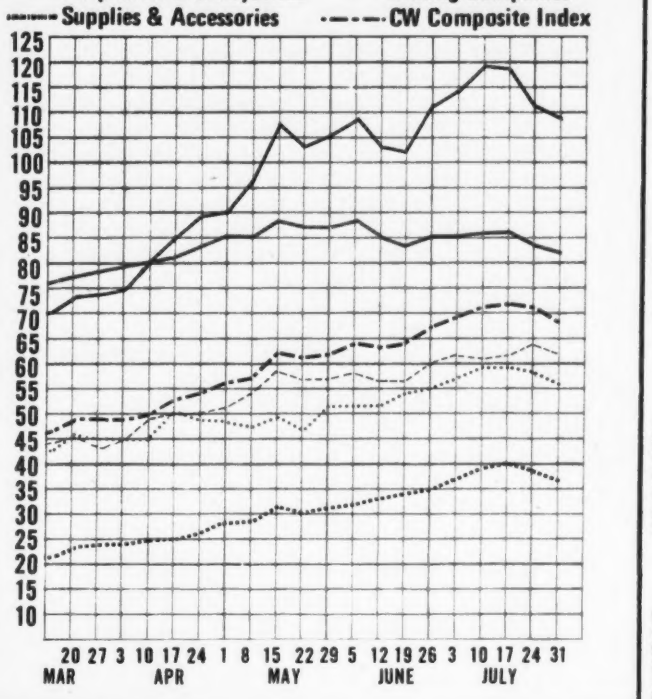
	1975 (000)	1974 (000)
aRevenue	$6,110,000	5,520,000
Spec Cred	.....	b26,000
Earnings	118,800	269,900

a-From the sale of real estate as the result of a plant relocation. a-Dollar amounts have been converted at the yen's current rate.

ANDERSON JACOBSON
Year Ended March 31

	1975	1974
Shr Ernd	$.27	$.19
Revenue	13,360,309	8,645,489
Earnings	663,906	475,095
3 Mo Shr	.08	.06
Revenue	3,929,100	2,541,800
Earnings	185,600	151,700

COMPUTERWORLD Computer Stocks Trading Indexes



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TRADE*QUOTES

Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, JULY 30, 1975

All statistics compiled, computed and formatted by TRADE*QUOTES, INC. Cambridge, Mass. 02139

EXCH		1975 RANGE (1)	CLOSE JUL 30 1975	WEEK NET CHNGE	WEEK PCT CHNGE
	COMPUTER SYSTEMS				
N	BURROUGHS CORP	62-109	95 1/2	-4 7/8	-4.8
O	COMPUTER AUTOMATION	2- 10	7 7/8	- 5/8	-7.3
N	CONTROL DATA CORP	11- 23	18	- 3/8	-2.0
N	DATA GENERAL CORP	10- 38	32 1/4	+1 1/8	+3.6
O	DATAPOINT CORP	6- 26	21 1/2	-2 1/2	-10.4
O	DIGITAL COMP CONTROL	1- 4	3 3/4	+ 3/4	+25.0
N	DIGITAL EQUIPMENT	46-122	111 1/2	0	0.0
N	ELECTRONIC ASSOC.	2- 3	2 7/8	- 1/8	-4.1
A	ELECTRONIC ENGINEER.	5- 10	8 1/2	- 3/8	-4.2
N	FOXBORO	23- 42	36	-1	-2.7
O	GENERAL AUTOMATION	6- 14	10 3/4	-1 1/4	-10.4
O	GRI COMPUTER CORP	1- 1	5/8	0	0.0
N	HEWLETT-PACKARD CO	58-120	108 1/8	-2 1/2	-2.2
N	HONEYWELL INC	22- 40	32 5/8	+ 5/8	+1.9
N	IBM	158-224	194 7/8	+1 7/8	+0.9
O	MEMOREX	1- 10	9 3/8	0	0.0
O	MICRODATA CORP	2- 6	4 7/8	- 3/8	-7.1
O	MODULAR COMPUTER SYS	5- 19	15 1/2	- 3/4	-4.6
N	NCR	15- 39	30 3/4	- 3/8	-1.2
O	PRIME COMPUTER INC	2- 6	5 3/4	+ 3/4	+15.0
N	PERKIN-ELMER	16- 30	25 5/8	- 3/8	-1.4
N	RAYTHEON CO	26- 59	49 1/2	-2	-3.8
N	SINGER COMPANY	10- 17	13 3/4	-1 1/4	-8.3
N	SPERRY RAND	26- 49	42 1/8	-1 5/8	-3.7
A	SYSTEMS ENG. LABS	1- 5	3 3/8	- 3/8	-10.0
O	ULTIMACC SYSTEMS INC	1- 6	6 5/8	0	0.0
N	VARIAN ASSOCIATES	7- 18	15 1/4	- 5/8	-3.9
N	WANG LABS.	7- 17	13 1/4	- 5/8	-4.5
N	XEROX CORP	51- 86	61 1/4	+ 3/4	+1.2
	LEASING COMPANIES				
O	COMDISCO INC	1- 5	3 1/2	- 5/8	-15.1
A	COMMERCE GROUP CORP	2- 4	3 1/8	+ 1/4	+8.6
A	COMPUTER INVSTRS GRP	1- 2	7/8	- 1/8	-12.5
M	DATRONIC RENTAL	1- 1	5/8	0	0.0
A	DCL INC	1- 1	1/2	0	0.0
N	DPF INC	3- 6	5 1/8	- 1/8	-2.3
O	EDP RESOURCES	2- 2	2	0	0.0
A	GRANITE MGT	1- 5	4	- 3/8	-8.5
A	GREYHOUND COMPUTER	2- 3	3	- 1/8	-4.0
A	ITEL	3- 9	7 3/8	0	0.0
N	LEASCO CORP	4- 8	7 1/8	-1 1/8	-13.6
O	LEASPAC CORP	1- 1	1/4	0	0.0
O	LECTRO MGT INC	1- 1	1/8	0	0.0
O	NRG INC	1- 4	3	+ 1/8	+4.3
A	PIONEER TEX CORP	2- 7	5 1/8	- 3/8	-6.8
A	ROCKWOOD COMPUTER	1- 1	5/8	0	0.0
N	U.S. LEASING	9- 14	11 1/4	- 3/4	-6.2

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

EXCH		1975 RANGE (1)	CLOSE JUL 30 1975	WEEK NET CHNGE	WEEK PCT CHNGE
	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	1- 1	7/8	0	0.0
A	APPLIED DATA RES.	1- 10	2 1/8	- 1/4	-10.5
N	AUTOMATIC DATA PROC	29- 65	60 1/2	-1	-1.6
O	BRANDON APPLIED SYST	1- 1	1/4	0	0.0
O	CENTRAL DATA SYSTEMS	3- 6	5 1/2	0	0.0
O	COMPUTER DIMENSIONS	2- 6	4 1/2	0	0.0
O	COMP ELECTION SYSTMS	3- 6	4 7/8	+ 3/8	+8.3
O	COMPUTER HORIZONS	1- 1	3/4	0	0.0
O	COMPUTER NETWORK	1- 3	2 3/8	- 5/8	-20.8
N	COMPUTER SCIENCES	2- 6	5 3/8	- 1/8	-2.2
O	COMPUTER TASK GROUP	1- 1	5/8	0	0.0
O	COMPUTER USAGE	2- 4	2 1/4	0	0.0
O	COMSHARE	3- 4	3 1/8	- 1/8	-3.8
O	DATATAB	1- 2	1 5/8	+ 3/8	+30.0
A	ELECT COMP PROG	1- 1	1/4	0	0.0
N	ELECTRONIC DATA SYS.	12- 28	19	-2 5/8	-12.1
O	INFONATIONAL INC	1- 1	1/8	0	0.0
O	IPS COMPUTER MARKET.	1- 1	5/8	0	0.0
O	KEANE ASSOCIATES	2- 3	2 1/4	0	0.0
O	KEYDATA CORP	2- 3	2 3/4	0	0.0
O	LOGICON	3- 5	4	0	0.0
A	MANAGEMENT DATA	1- 3	2 1/8	0	0.0
O	NATIONAL CSS INC	6- 14	9	-1	-10.0
O	NATIONAL COMPUTER CO	1- 1	1/8	0	0.0
A	ON LINE SYSTEMS INC	8- 17	15 1/4	-1 1/4	-7.5
N	PLANNING RESEARCH	2- 6	4	- 3/8	-8.5
O	PROGRAMMING & SYS	1- 1	3/4	0	0.0
O	RAPIDATA INC	2- 5	4 1/8	- 1/8	-2.9
O	REYNOLDS & REYNOLD	11- 24	14	-2 1/2	-15.1
O	SCIENTIFIC COMPUTERS	1- 1	1	0	0.0
O	SIMPLICITY COMPUTER	1- 1	5/8	0	0.0
O	TYMSHARE INC	7- 21	17 3/8	- 1/2	-2.7
A	URS SYSTEMS	2- 4	3 1/8	- 3/4	-19.3
N	WYLY CORP	2- 4	4	- 1/8	-3.0
	PERIPHERALS & SUBSYSTEMS				
N	ADDRESSOGRAPH-MULT	4- 9	6 3/4	- 7/8	-11.4
O	ADVANCED MEMORY SYS	1- 7	5 1/8	- 1/8	-2.3
N	AMPEX CORP	3- 7	6 3/8	- 3/8	-5.5
O	ANDERSON JACOBSON	1- 3	2 5/8	- 1/4	-8.6
O	BEEHIVE MEDICAL ELEC	1- 5	3 5/8	- 7/8	-19.4
A	BOLT,BERANEK & NEW	5- 13	9 1/4	-1 1/8	-10.8
N	BUNKER-RAMO	4- 8	5 5/8	-1 1/2	-21.0
A	CALCOMP	4- 7	5 3/4	- 1/8	-2.1
O	CAMBRIDGE MEMORIES	3- 5	4 5/8	+ 1/8	+2.7
N	CENTRONICS DATA COMP	7- 25	18 7/8	-1 1/8	-5.6
O	CODEX CORP	15- 38	34 1/4	-2 3/4	-7.4
O	COGNITRONICS	1- 2	1 1/2	0	0.0
O	COMPUTER COMMUN.	1- 2	1 3/8	- 1/8	-8.3
O	COMPUTER CONSOLES	3- 7	5 1/4	0	0.0
A	COMPUTER EQUIPMENT	1- 2	1 7/8	- 1/8	-6.2
O	COMPUTER MACHINERY	1- 2	1 3/4	- 1/8	-6.6
O	COMPUTER TRANSCEIVER	1- 2	1 1/8	- 1/4	-18.1
O	COMTEN	2- 5	4 1/8	- 1/4	-5.7
N	CONRAC CORP	12- 23	18 3/4	-1 7/8	-9.0

EXCH		1975 RANGE (1)	CLOSE JUL 30 1975	WEEK NET CHNGE	WEEK PCT CHNGE
O	DATA ACCESS SYSTEMS	1- 3	2 1/4	0	0.0
O	DATA 100	5- 16	10 1/8	-2 1/4	-18.1
A	DATA PRODUCTS CORP	2- 6	4 1/4	- 3/4	-15.0
O	DATA TECHNOLOGY	1- 3	1 5/8	+ 1/8	+8.3
O	DATUM INC	1- 2	1 7/8	0	0.0
O	DECISION DATA COMPUT	4- 7	5 1/8	0	0.0
O	DELTA DATA SYSTEMS	1- 1	1/4	0	0.0
O	DI/AN CONTROLS	1- 1	1 1/2	0	0.0
N	ELECTRONIC M & M	1- 3	2 1/4	- 1/8	-5.2
O	FABRI-TEK	1- 1	1 1/4	- 1/8	-9.0
O	GENERAL COMPUTER SYS	1- 2	2	0	0.0
N	HAZELTINE CORP	3- 6	4 3/8	- 3/8	-7.8
N	HARRIS CORP	18- 28	24 3/8	- 5/8	-2.5
A	INCOTERM CORP	3- 12	11 1/4	+ 1/4	+2.2
O	INFOREX INC	2- 5	3	- 5/8	-17.2
O	INFORMATION INTL INC	8- 14	13 1/2	0	0.0
A	LUNDY ELECTRONICS	3- 3	2 7/8	0	0.0
O	MANAGEMENT ASSIST	1- 1	5/8	0	0.0
A	MILGO ELECTRONICS	8- 24	19 3/4	-2	-9.1
N	MOHAWK DATA SCI	1- 5	2 3/4	- 1/4	-8.3
O	OPTICAL SCANNING	1- 3	2 3/4	0	0.0
O	PENRIL CORP	2- 2	1 3/4	0	0.0
O	PERTEC CORP	2- 8	6	- 1/8	-2.0
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
O	PRECISION INST.	1- 1	1	0	0.0
O	QUANTOR CORP	2- 6	4 7/8	- 3/8	-7.1
O	RECOGNITION EQUIP	2- 9	7 1/8	- 1/4	-3.3
N	SANDERS ASSOCIATES	3- 11	7	-1 3/4	-20.0
O	SCAN DATA	1- 3	2 1/4	- 1/4	-10.0
O	STORAGE TECHNOLOGY	6- 17	14 1/8	-1	-6.6
O	SYCOR INC	5- 15	11	-3	-21.4
O	T BAR INC	3- 6	5 1/4	- 1/2	-8.6
O	TALLY CORP.	1- 5	3 3/8	- 1/8	-3.5
O	TEC INC	1- 4	3 1/2	0	0.0
N	TEKTRONIX INC	18- 41	35	-3	-7.8
N	TELEX	1- 3	2 5/8	0	0.0
O	WANGCO INC	4- 9	7	- 1/4	-3.4
O	WILTEK INC	1- 4	3	0	0.0
	SUPPLIES & ACCESSORIES				
O	BALTIMORE BUS FORMS	4- 5	4 1/2	0	0.0
A	BARRY WRIGHT	5- 7	6 5/8	- 1/8	-1.8
O	CYBERMATICS INC	1- 1	5/8	0	0.0
A	DATA DOCUMENTS	29- 42	34	+ 7/8	+2.6
O	DUPLEX PRODUCTS INC	12- 25	18 1/8	-1 3/4	-8.8
N	ENNIS BUS. FORMS	5- 7	5 7/8	0	0.0
O	GRAHAM MAGNETICS	5- 10	8	- 1/2	-5.8
O	GRAPHIC CONTROLS	8- 21	13 1/4	- 5/8	-4.5
N	3M COMPANY	43- 68	57	- 1/2	-0.8
O	MOORE CORP LTD	39- 51	48 1/2	-1 3/4	-3.4
N	NASHUA CORP	15- 22	15 5/8	- 3/8	-2.3
O	STANDARD REGISTER	11- 20	18	-1	-5.2
O	TAB PRODUCTS CO	4- 8	6 1/2	- 1/4	-3.7
N	UARCO	17- 24	22	0	0.0
O	VANIER GRAPHICS CORP	4- 7	5 1/2	+ 1/4	+4.7
A	WABASH MAGNETICS	3- 5	4 1/4	- 3/8	-8.1
N	WALLACE BUS FORMS	15- 25	20 1/2	-1	-4.6

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